

X-Analysis User Manual

Software version 11.1, 12082015

Publication Information

© 2015 Fresche Legacy Inc. Published by:

Fresche Legacy Inc. 995 Wellington Suite 200 Montreal, QC Canada, H3C 1V3

Tel.: (514) 747.7007 (toll-free in US and Canada): 1.800.361.6782 (toll-free in Belgium, France, Germany, UK): 00 800 361 67 82 0 (toll-free in Australia): 0011 800 361 6782 0

E-mail for inquiries: <u>info@freschelegacy.com</u> E-mail for support: <u>Support@freschelegacy.com</u>

Web: www.freschelegacy.com

Title: X-Analysis User Manual, software version 11.1

Publication Date: August 2015

Fresche Legacy documentation team Kim Chan, Shilpi Khan Chaudhary, Vincent Gardner

Trademarks

X-Analysis, X-Analysis Professional and X-2E Modernize are trademarks or registered trademarks of Fresche Legacy Inc. or its subsidiary, Databorough Ltd. <iSeries, Power Systems, Power8> are registered trademarks of IBM Corporation. Microsoft and Microsoft Windows are registered trademarks of Microsoft Corporation. All other brand and product names are trademarks or registered trademarks of their respective companies.

No part of this document may be reproduced or transmitted in any form or by any means, without prior permission in writing from Fresche Legacy.

The information in this manual is believed to be correct at the time of publication. However, Fresche Legacy Inc. makes no warranty, express or implied, about the accuracy of this information and reserves the right to revise this document or make changes to the products described herein at any time without notice and without obligation. Fresche Legacy Inc. is not liable for any loss of data, damage to databases or other software, or any other losses arising from the use of this manual.

Contents

Publication Information	2
Contents	3
Preface	9
Overview	11
Acronyms used in the Manual	11
Introduction to X-Analysis	12
Profile Authority Requirements	12
Configure Cross-Reference Library	13
Work with X-Analysis for Applications	13
Libraries	14
Exclusions	16
Initialization	17
Generating the Data Model	19
Refresh the Cross-Reference Library	
Variable Program Calls from Files/Programs	21
Using X-Analysis Client	25
Sign-on dialog	25
Session Information	27
X-Analysis Menu	
License Manager	
X-Analysis Preferences	44
Advanced Preferences	
Folders Preferences	49
General Preferences	50
X-Data Test Preferences	52
X-Redo Preferences	
X-Redo Advanced Preferences	
Application Library	
Work with Application Libraries	
Application Library Menu Options	
New Application Area	
Add Alternate Data Library List	58
Refresh Options	
Derive Business Rules	
Import Options	67
Export Options	
Document Entire Application	
Document Changed Objects	
Reengineer Programs	72

Generate Programs	74
Inter-Repository Options	75
Audit Options	75
Work With Multiple List Options	76
Object List	77
Member List	
Source Files	85
Business Rules	86
Consolidated Rules	86
Screen Components	87
Change History	90
Regenerated Programs	92
Source Scan	93
Procedures	95
Application Area	
Add Application Area	
Adding Object to an Application Area	101
Removing Object from an Application Area	103
Context menu on an Application Area	104
Application Area Options	105
Derive Business Rules	117
Export Options	
Annotate	
Document Application Area	117
Data Management Options	117
Test Management Options	118
Reengineer Programs	124
Generate Programs	
Audit Options	
UML Options	
DDL Modernization node on an Application Area	
Application Area Diagramming	
Application Area Diagram	
Area Flow Diagram	
Quick Reference to an Object	
Jump to Dialog	
Source Browser View	
Object Where Used	
Variable Where Used	
File Field Details	
LFs/Access Paths	
Member X-Ref	
Enhanced Member X-Ref	

Add Bookmark1	.71
Program Logic Documentation1	.74
Data Flow Diagram1	.74
Structure Chart Diagram1	.83
Application Area SCD1	.90
Hierarchical Structure Chart Diagram1	.90
Inverted Structure Chart1	.97
Program Structure Chart/PSC1	.98
Overview Structure Chart/OSC1	.99
Screen/Report Design2	206
Screen Flow Diagram2	208
Access Path Diagram2	211
Screen Activity Diagram2	212
Data Model Diagram2	214
Generating DMD2	216
DMD for an Application Area2	217
Understanding Data Model Database2	:19
Options on Screen Components2	
Screen Source Code2	20
Function Editor 2	21
Preview Designer2	24
Page Designer2	
Data Content 2	28
Screen Actions2	29
Class Diagram 2	
Business Rules 2	
Component Documenter2	
Annotate2	
Development Screens 2	
Business Rules Analysis2	:36
	236
Derive Business Rules	
View Business Rules	
Inter-Repository Options	
Generate Difference Analysis	
Display Difference Analysis	
Customized Libraries	
Generate PTF Analysis	
PTF Analysis	
Manage Linked Repositories	
Audit Options	
Metrics Analysis	
Screen Metrics 2	.63

File Metrics	266
Business Process Logic Metrics	267
Specialized Analysis	267
Problem Analysis	275
Object Allocation	277
Database Summary	278
Summary Report	278
Initialize Source Archiving	282
Generate Metrics Analysis	283
Edit Problem Audit Limit	283
Edit Problem Categories	284
Generate Problem Analysis	289
View Database Size Statistics	289
UML Diagramming	294
The Pre-requisites	294
Re-generate UML	294
Activity Diagram	294
Class Diagram	
Re-generate UML for Application Area	
Data Management Features	299
View Data	
Data Dictionary	
Data Dictionary Overrides	
Verify Data Relationships	
Subset/Archive Filter	311
Subset Data	
Archive Data	
Purge Data	
Archive & Purge Data	
Exporting & Printing	
Export to PDF	
Export to Microsoft Word	
Export to Microsoft Excel	
Export to Flowchart	
Printing from X-Analysis	
Export as DDL from X-Analysis	
Convert DDS to SQL	
Generate Database Service Programs	
Document Manager	
Marking the individual objects/complete list	
Documenting an Application Area	
Documenting an Entire Application	
Document Changed Objects	374

Viewing the Generated Document	. 374
Limitations of X-Analysis System Documenter	. 377
Using the Annotator	
Appendix A – X-Analysis Offline	.379
X-Analysis Offline Prerequisites	. 379
Start X-Analysis Offline	. 380
Appendix B – Enabling the SEU Interface	.382
Create User Profile XAN4SEU	. 382
Creating macro of XAN4SEU	. 383
Appendix C – Component Documenter	.387
Work with Component Documenter	. 387
Appendix D – XREDOAPP Command	.396
Set the Library List	. 396
Options available on the XREDOAPP command interface	. 397
X-2E Data Areas	. 409
Appendix E – Overriding Data Tables	.411
Synon Function Key / Option Defaults	. 411
Synon Function Key/Option Extra Defaults	. 412
Appendix F – X2E Specific Features	.413
Reengineering of Non-2E Programs	. 413
Action Diagram	. 416
Business Rules	. 417
Migrated Logic	. 418
Reengineered Action Diagram	. 419
INTERNAL ROUTINES Objects	. 420
Business Process Logic Metrics	. 421
Generating Java application	. 423
Appendix G – Troubleshooting	.426
X-Analysis Perspective not visible/working after upgrading X-Analysis Client	. 426
X-Analysis menu on the main menu bar disappears from X-Analysis Perspective.	. 427
Error in running X-Analysis installed on Windows Vista for the first time	. 427
Initialization reports	. 428
System documentation failed: FileNotFoundException	. 428
SWTException on Windows 2000 machines	. 429
Screen/Report Design feature fails with Server Job Error	. 430
X-Analysis Diagnostics utility	. 430
Error message appears on Signon to X-Analysis	.431
Data Flow Diagrams are unavailable	. 432
Setting the password field	. 434
Error in generating program documentation	. 435
Using the French interface	
Appendix H – Refresh X-Analysis	.437
XREFRESH	. 437

XAXREF	
Appendix I – X-Analysis Indexes Job Scheduler Entries	
XASCDEIDX Command	
XAROBOT Command	
Appendix J – Dual Installation of X-Analysis	
Appendix K – Use SSL feature	
Appendix L – Setting Status for Business Rules	
Business Rules Status*	
Business Rules Status Category	
Appendix M – Export to Google Drive	457
Appendix N – Code Review feature (TD/OMS support)	
Appendix O - RSE (Remote System Explorer) on RDi	
Index	

LEGACY

Preface

ABOUT THIS GUIDE

This guide, X-Analysis User Manual, describes how to use X-Analysis and its other related modules. In particular it discusses the following topics:

- Configuring X-Analysis
- Using X-Analysis Client
- License Manager (V2 licensing)
- Application Library/Areas
- Diagramming features
- Screen Components
- Business Rules Analysis
- Audit Options
- Document Manager

Version

This guide describes X-Analysis, software version 11.1.

How to use this guide

The manual has 17 chapters. Each chapter throws light on one or more of the diverse X-Analysis features which adequately support advanced analysis and documentation tasks. The Appendices contain the other crucial technical details relevant to understanding and using X-Analysis. The topics progress from general ideas to more advanced concepts, building on the earlier chapters.

This guide will prove to be very useful for software professionals–from analysts and developers to architects and operations teams–intending to analyze, document, or modernize AS/400 IBM i applications. Explore this guide to gain insight into the inimitable facets of X-Analysis that equip users with rich understanding of existing legacy applications.



The X-Analysis suite of products contains a total of eight modules. This guide describes only the following module, X-Analysis. For information about the other modules, please contact your Fresche Legacy representative, or visit us at <u>www.freschelegacy.com</u>.

Overview

LEGACY

A comprehensive, stepwise, illustrative guide that encapsulates the advantages of X-Analysis as a multipurpose software product suite!

X-Analysis comes fully equipped to address all analysis and documentation needs – from analyzing Metrics to decoding monolithic Business Rules and many more. In sum, X-Analysis is a power-packed toolset, designed to keep technical complexities at bay, making conversion of existing application designs into the latest format a much easier exercise.

ACRONYMS USED IN THE MANUAL

Acronym	Full Form
APD	Access Path Diagram
DFD	Data Flow Diagram
DMD	Data Model Diagram
FFD	File Field Details
SCD	Structure Chart Diagram
HSC	Hierarchical Structure Chart
PSC	Program Structure Chart
OSC	Overview Structure Chart

Introduction to X-Analysis

X-Analysis[#] is a proven world-leading tool used by analysts, developers, architects and operations teams for analysing, documenting, modernizing, and rebuilding of IBM i applications. It provides detailed analysis and interactive diagrammatic constructs that enable rich understanding of existing applications. It also has a set of powerful reengineering facilities for automated database and application modernization which are integrated with the analysis and design extraction functions. Whether an applications is poorly structured or highly structured (e.g. Synon / 2E applications), X-Analysis can extract the design logic of the application, providing an excellent base for efficient and effective design recovery.

X-Analysis is a suite of modules fully integrated with IBM Rational products (WDSc, RDp, RDi, etc.) and MyEclipseBlue. It also runs standalone on Eclipse without any other product dependencies. Individual modules are grouped together to provide useful solution sets that meet a number of requirements around a central theme.

PROFILE AUTHORITY REQUIREMENTS

The initialization/refresh jobs make extensive use of various IBM i commands like CRTDUPOBJ, CRTPF, CRTLF, DLTF, RGZPFM, RTVMBRD, CRTLIB, CLRLIB, RSTLIB, DLTLIB, DSPFD, DSPFFD, DSPPGMREF, DSPDBR, CLRPFM, CPYF, CRTDTAARA, RTVOBJD, ALCOBJ, DLCOBJ, DLTUSRIDX, DSPOBJD, RTVSYSVAL, RTVDTAARA.

In order to run the X-Analysis jobs on an IBM i machine, it is recommended to use the **QPGMR** profile or the user profile having **QPGMR** as the group profile.

Regardless of the profile used, you should have the following authorities:

- The profile must have a *USE authority to all of the commands listed above and also *SAVSYS special authority.
- For the Source and the Object libraries specified during setup The profile used requires object operational (*OBJOPR) authority to all programs and files in these libraries. The profile also requires execute (*EXECUTE) authority on all of these libraries.
- For the X-Analysis cross-reference library The profile used must have full rights to this library. If you do not use the **QPGMR** profile, you must make sure the profile used has ***ALL** rights to all objects in the supplied X-Analysis libraries.

For details, refer to Initializing_X-Analysis.doc.

X-Analysis release 10.x onwards is digitally signed.

Configure Cross-Reference Library

Before the X-Analysis Client can be used, the cross-reference library i.e. the application repository has to be built. The initialization process takes care of the setting up of the cross-reference database.

This chapter presents the steps, specific command screens, and the command keys for building a cross-reference library.

WORK WITH X-ANALYSIS FOR APPLICATIONS

On the IBM i, type the **X4WRKAPP** command and press **ENTER**.

X-Analysis/4 XARWKAPP	Work with X-Analysis/4	Applications Databorough Ltd. 12:58:51		
		21 Jan 2015		
Enter options,	press Enter.			
1=Authorities 2=Change 3=Copy 4=Delete 5=Display 7=X-A Log 8=Libraries 9=Variable Calls 10=App areas 11=Reports 12=Initialise 13=Build data model 14=Refresh 15=Gen Business Rules 16=Exclusions 17=Objects 18=Pgm Stds				
X-ref Lib	Text	Company/division		
XAN4CDXA XAN4CDEM Tutorial System				
F1=Help F3=E:	xit F6=Add F10=Cmd Line	F12=Cancel F24=More Keys		

X4WRKAPP command screen

The **X4WRKAPP** is the master command menu of the X-Analysis Server. The first step is to add a new cross-reference library. Press **F6** to add a cross-reference library.

X4WRKAPP – Add Application screen

X-Analysis/4	Work w	ith X-Analysis/4	Applications	Databorough Ltd.
XARWKAPP				13:26:21
				21 Jan 2015
X-ref Library		•		
Text		•		
Company/division		•		
Index src files		. Ү		
Process var & bound c	alls	. Ү		
Include obsolete sour	ce	•		
Build data model		•		
Data model match valu	e	•		
TCPIP address				
User iD		•		
		El 2-Canaal		
F1=Help F3=Exit		F12=Cancel		

LEGACY

This option will add an entry to the list of the X-Analysis/4 applications and create a new (empty) cross-reference library. You must specify the name of the cross-reference library (e.g. **XAN4CDXA**). You can optionally specify text and a company name.

```
X4WRKAPP – Application added
```

```
Work with X-Analysis/4 Applications
X-Analysis/4
                                                             Databorough Ltd.
XARWKAPP
                                                                   13:26:21
                                                                  21 Jan 2015
X-ref Library. . . . . . . .
                                  XAN4CDXAT
Text . . . . . . . . . . . . . . . .
                                  XAN4CDEM1 Tutorial System
Company/division . . . . . .
Index src files. . . . . . .
                                  Υ
Process var & bound calls. . .
                                  Υ
Include obsolete source . .
Build data model . . . . .
Data model match value
                         . . .
TCPIP address . . . . . . .
User iD . . . . . . . . . . .
F1=Help
              F3=Exit
                             F12=Cancel
```

LIBRARIES

After successfully adding the cross-reference library, the next step is to provide libraries for the cross-reference library. These libraries are used when initializing the application and for various other commands which need this information.

Select **Option 8** to assign the Source, Object and Model (2E) Libraries.

```
X4WRKAPP – Libraries screen
```

X-Analysis/4 XARWKLIB	Work with X-Ar	nalysis/4 Appli	cation Libraries	Databorough Ltd. 13:28:28 21 Jan 2015			
Selected x-ref	Library -> :	XAN4CDXAT					
	Enter options, press Enter. 2=Change 4=Delete 5=Display						
Type Sequence Library							
F1=Help	F3=Exit	F6=Add	F12=Cancel	F16=Print			



The sequence of libraries is important because the objects and the sources are given preference according to the order of the library they belong to. Only the first occurrence of the object/source gets reported. Subsequent occurrences are omitted.

Press **F6** to add the names of the Source / Object / Model libraries associated with the application, and press **ENTER**. Repeat the step if application consists of multiple libraries. Press **F3** when all the libraries have been defined.

X-Analysis/4 XARWKLIB	Work with X-Ana	alysis/4 Application Libraries	Databorough Ltd. 13:28:28 21 Jan 2015
X-ref library.	XAN4CDXAT		
Type Sequence Library	. 0 . 1.00	(O=Object,S=Source,M=2E Model)	
F1=Help	F3=Exit	F12=Cancel	

The Type may be any one of the following:

- O=Object
- S=Source
- M=Model

Source & Object Libraries

While the source library contains the un-compiled source files, the object library comprises the compiled objects for the same.

Specify the libraries containing both source and object as O and S types. See the settings on the 'XAN4CDXA – Tutorial Application'. It has XAN4CDEM specified as 'O' and 'S' types.

Cool/2E (Synon Model) Libraries

In order to analyze a Synon application, the Synon model library(s) can be specified by putting the library type as " \mathbf{M} ". The initialization process picks the data model information in the Synon model library(s) when creating the X-Ref library.

Before moving on to the initialization step, you should confirm that the X2E-specific Data Areas are set with appropriate values. For details, refer to **Appendix D**.

EXCLUSIONS

The exclusions can be set up using the "**Exclusions**" option from the master command menu – **X4WRKAPP**. Select **Option 16** to do this and press **ENTER**.

X4WRKAPP – Work with Exclusions screen

X-Analysis XARWKXCS	Work with Exclusions	Databorough Ltd. 13:39:42
Enter options, 5=Work with	press Enter.	21 Jan 2015
Program	Description	
XARWKSCE XARWKSFE XARWKBRC XARWKHRE XARWKUMLE	Work with Diagram Exclusions Work with Source File Exclusions Work with Business Rule Call Exclusions Work with Hierarchy Exclusions Work with UML Exclusions	
F1=Help F3=Ex	kit F10=Cmd line F12=Cancel F14=WRKSBMJ	JOB F24=More keys

The exclusions screen provides a menu for object exclusion. The options are:

- **XARWKSCE** Work with Diagram Exclusions
- **XARWKSFE** Work with Source File Exclusions
- **XARWKBRC** Work with Business Rule Call Exclusions
- **XARWKHRE** Work with Hierarchy Exclusions
- **XARWKUMLE** Work with UML Exclusions

XARWKSCE – Work with Diagram Exclusions

The objects which are excluded using this option will not appear in the following:

- Structure Chart Diagrams
- Data Flow Diagrams
- Object Where Used data
- Application Areas

Note: The excluded programs will appear in the Program Structure Charts.

You should specify an object name and any required descriptive text. The object name can be generic. If an individual object name is specified, then it is validated against all objects currently loaded into X-Analysis. If a file name is specified, then it must be a physical file name. All logical views built over an excluded physical file are also excluded.

XARWKSFE – Work with Source File Exclusions

Use this option to exclude source files. Excluded source files will not be loaded into X-Analysis. Specify a particular or generic file name. You can specify a particular library name or ***ALL**, or leave the name blank. A blank library name is equivalent to ***ALL**.

XARWKBRC – Work with Business Rule Call Exclusions

Use this option to set up Business Rule call exclusions. Specify program name which you wish to exclude.

XARWKHRE – Work with Hierarchy Exclusions

The **Hierarchy Exclusion** option is used to prevent all the programs called by the excluded programs to be shown in the Structure Chart Diagram and the Overview Structure Chart. The excluded programs in SCD or OSC are highlighted by a green arrow next to it.

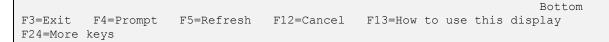
XARWKUMLE – Work with UML Exclusions

Use this option to exclude objects for UML diagram. Specify the object name which you wish to exclude from the UML diagram.

INITIALIZATION

The initialization can now be executed. From the master command (**X4WRKAPP**) screen, select **Option 12** against the cross-reference library for initialization.

Initialis	e X-Analysis/4	(XAXR	EF)
Type choices, press Enter.			
<pre>X-Analysis Library > Object Libraries + for more values</pre>	XAN4CDXAT *SPECIFIED	Name, Name,	*SPECIFIED
Source Libraries	*SPECIFIED	Name,	*SPECIFIED, *NONE
Index Source Files Build Data Model Generate Business Rules Initialise X-Resize Include obsolete source/object	*CHG *NO *NO *NO *NO	*CHG, *YES, *YES, *YES, *YES,	*NO *NO



You can change the default job queue (QBATCH) by changing the job description for XAOBJ/XAN4. Use the following command to change the job description:

WRKJOBD JOBD(XAOBJ/XAN4)

You should also change XAOBJ/XDMJOBD, as this is used by Option 13=Build Data Model on X4WRKAPP (for XA4MODEL command).

Press **ENTER** to submit a batch job, which executes the initialization steps.

Feature	Brief Description
X-Analysis Library	The X-Analysis cross-reference library name.
Object Libraries	Special value *SPECIFIED is selected by default. It means that X-Analysis will retrieve all object libraries you have previously specified (using Option 8).
Source Libraries	Special value *SPECIFIED is selected by default. It means that X-Analysis will retrieve all source libraries you have previously specified (using Option 8).
Index Source Files	Specify whether or not to create indexes over the source files. These indexes will allow the immediate display of "where used" data. They may be required for the generation of the data model, depending on which options are taken. If the indexes are not built now, they can be built for an individual Source Member at the time they are viewed through the X-Analysis browser. Select one of the following:
	 *CHG – Only update current indexes. It will find newly added source members and remove deleted members. It will also index any source member that has changed since the last initialisation.
	• *NO – Do not build the indexes
	 *ALL – It is similar to *CHG when it comes to finding new members and removed members. It will index all source members without checking the change date.
	 *UPG – Upgrade the X-Analysis database and rebuild all data including all indexes (replacing current ones).
Build Data Model	If you take the option to build the data model for your application then you can view it through X-Analysis. Select one of the following:
	• *YES – Build the data model
	 *NO – Do not build the data model
	Should have the X-Analysis Professional set for this to work.
Generate Business Rules	If you take the option to generate the business rules for your application then you can view it through X-Analysis. Select one of the following:
	*YES – Generate Business Rules
	*NO – Do not generate Business Rules
	Should have the X-Rules set for this to work.

Feature	Brief Description
Initialize X-Resize	If you take the option to generate the X-Resize Project for your application then you can view it through X-Analysis. Select one of the following:
	• *YES – Initialise X-Resize Project
	*NO – Do not initialise X-Resize Project
	Should have the X-Field Resize Module for this to work.
Include obsolete	If you set this as:
source/object	• *YES – It will pick the name of the same Object/Source from the Library List of the X-Ref.
	 *NO – Only the first instance of the same Object/Source from the Library List of the X-Ref will get picked.
	Obsolete source refers to source members for which there is another source member with the same or similar attributes higher up in the load library list.
	Obsolete objects are likewise defined as objects for which there is another object with the same or similar attributes higher up in the load library list.

GENERATING THE DATA MODEL

You should attempt to build the data model only if you have purchased the Reengineering Data Modelling Module.

X-Analysis provides a data-modelling environment on IBM i. It can re-engineer a current application, and then automatically generate the data model and the process model. The (logical) data model or entity relationship diagram is derived from the physical data model implicit in the application.

The initialization procedure asks for generating the Data Model. If you have not generated the Data Model, then the next step is to generate it. To do this, select **Option 13** on the **Work with X-Analysis/4 Applications** menu.

X-Analysis/4 Work with X-Analysis/4 Applications Databorough Ltd. XARWKAPP 13:26:21 21 Jan 2015 Enter options, press Enter. 1=Authorities 2=Change 3=Copy 4=Delete 5=Display 7=X-A Log 8=Libraries 9=Variable Calls 10=App areas 11=Reports 12=Initialise 13=Build data model 14=Refresh 15=Gen Business Rules 16=Exclusions 17=Objects 18=Pgm Stds X-ref Lib Text Company/division XAN4CDXA XAN4CDEM Tutorial System 13 XAN4CDXAT XAN4CDEM Tutorial System

Press ENTER.

Generate Data Model (XA4MODEL) Type choices, press Enter. X-Analysis library > XAN4CDXAT Name



```
Data libraries . . . . . . . > XAN4CDEM1 Name
+ for more values
Model method . . . . . . . . > *PGMLOGIC *PGMLOGIC, *NAMES, *CA2E...
```

Press **ENTER** to run the modelling command. This principal command runs in batch and completes the modelling process.

Feature	Brief Description
X-Analysis Library	The X-Analysis cross-reference library name.
Object Libraries	Specify the data library names.
Model Method	* PGMLOGIC – Derive foreign keys from RPG/LE program logic. Relationships are only considered valid when foreign keys match all the components of the owning file's primary identifier.
	* CA2E – The entire data model has been generated by Synon. Use only the Synon data model database to derive the data model.
	*NAMES – Only derive foreign keys for owning relationships, taking into account the option specified in the 'Matching Method' parameter.
	*BOTH – Derive foreign keys taking into account the Program Logic and the *NAMES OR Program Logic and *CA2E (in case of CA2E application).

REFRESH THE CROSS-REFERENCE LIBRARY

Attempt the Refresh option only when you have modified Objects / Members.

X-Analysis provides a refresh command to register changes in Objects/Members of the application library to the cross-reference library. The **XREFRESH** command refreshes the X-Analysis cross-reference database for the specified libraries for all the changed objects.

The refresh will have no effect unless there are changes to (at least) one of the source files registered in the cross-reference database. This command will update the Object and the Member lists immediately, and run a separate job to re-index the appropriate source code.

To run the refresh command from the **5250** screen, go to the master command menu (**X4WRKAPP**) and select **Option 14** against the cross-reference library.

X-Analysis/4 Work with X-Analysis/4 Applications Databorough Ltd. XARWKAPP 13:26:21 21 Jan 2015 Enter options, press Enter. 1=Authorities 2=Change 3=Copy 4=Delete 5=Display 7=X-A Log 8=Libraries 9=Variable Calls 10=App areas 11=Reports 12=Initialise 13=Build data model 14=Refresh 15=Gen Business Rules 16=Exclusions 17=Objects 18=Pgm Stds X-ref Lib Company/division Text XAN4CDXA XAN4CDEM Tutorial System 14 XAN4CDXAT XAN4CDEM Tutorial System



Press ENTER to invoke the XREFRESH command screen (displayed below):

Refresh Changed Objects (XREFRESH)

```
Type choices, press Enter.
```

X-Analysis Library > XAN4CDXAT Name Refresh Application Areas . . *NO *YES, *NO, Y, N Refresh Business Rules . . . *NO *YES, *NO

Feature	Brief Description
X-Analysis Library	The X-Analysis cross-reference library name.
Refresh Application Areas	If you wish to refresh the Application Areas, select *YES . If you select *NO , the Application Areas will not be updated.
Refresh Business Rules	If you wish to refresh the Business Rules for each changed program, select *YES . If you select *NO , the Business Rules will not be updated and you will need to re-generate all Business Rules next time to bring them up-to-date.

VARIABLE PROGRAM CALLS FROM FILES/PROGRAMS

RPG language allows the use of variables in the CALL statements where the variable would contain the name of the next program to be called at run-time. The variable might be getting the next program name through some database file or hard-coding in the program logic itself. In such cases, the display program references command shows the variable name instead of the actual program which would be called at run time. Therefore, some mechanism is required in X-Analysis to identify the possible programs which are called through variables at runtime.

In order to achieve this, **Option 9** has been provided on the **X4WRKAPP** screen where the variable calling setup can be done.

		X4WRKAPP cor	nmand screen	
X-Analysis/4 XARWKAPP	Work	with X-Analysis/4	Applications	Databorough Ltd. 12:58:51 21 Jan 2015
Enter options, pre 1=Authorities 2=Ch 9=Variable Calls 1 14=Refresh 15=Gen	nange 3=Cop .0=App area	as 11=Reports 12=1	Initialise 13=B	8=Libraries Build data model
X-ref Lib Tex	t		Company/divi	sion
XAN4CDXA XAN	14CDEM Tuto	orial System		
F1=Help F3=Exit	F6=Add	F10=Cmd Line	F12=Cancel	F24=More Keys

X4WRKAPP command screen

This provides access to the following:

Variable Program Calls from Files: You can add the relevant file containing the info about the program names to be called. The files listed in this screen are called Generic Files. These files are read by the program(s) to determine which programs to call based on certain keys.

Work with Generic Files allows you to maintain the details of the files which are read by a program in order to determine which programs to call.

Press **F6** to add a Generic File.

The following data should be maintained:

File name: The name of the database file which is used to retrieve the name of the programs to be called (the generic file). The name entered can be either a physical or a logical file name but it must be a 'keyed' file.

Key type – This field indicates the type of data used to retrieve the 'called program' name. Choose from:

*ALL – All records in the file are to be scanned to find the possible programs that can be called by the program.

***CONSTANT** – All records keyed by any value which is moved into the key field name (see below) within the calling program refer to programs which can be called by the program.

Key field name – This field **only** applies when the key type is specified as ***CONSTANT**. It identifies the name by which the key field is 'referred to' in the calling program. This is the field which has values moved into it to determine which programs should be called.

Variable Program Calls from Programs: This case is for the generic programs which are called by the other program – to either return the names of the programs to call or call further programs directly. The purpose of this setup is to bypass the intermediate (generic) program and directly display the actual/second-level program.

Press **F6** to add a Generic Program.

The following data should be maintained:

Program name – The name of the program which is called to call further programs.

Key Type – This field indicates the method used by the generic program to determine which programs to call. Choose from:

*ALL – All program references for the generic program are shown as references for the calling program.

***FILE** – The generic program uses a generic file to determine which programs to call. The references as defined through Work with Generic Files will be shown as references for the calling program.

File name – This field only applies when the key type above is specified as *FILE.

The file name is validated against the files maintained through the **Work with Generic** Files screen

Demo case

The example illustrated below displays the generic program using the generic file to determine which programs to call.

In this instance, **PG_V5** is a generic program called by **CL_GEN_PGM**. See **PG_V5** as listed under the Generic Programs list.

		work with Generic Programs screen	
X-Analysis/4 XARWKGPS		Work with Generic Programs	Databorough Ltd. 12:58:51
-	, press Enter. lete 5=Display		21 Jan 2015
Program	Туре	File name	
PG_V5	*FILE	PGNAME	

Work with Generic Programs screen

The following screen shows PGNAME as listed under the Generic Files list.

X-Analysis/ XARWKGFS	4	Work with Generic	Files	Databorough Ltd. 12:58:51
-	ns, press Enter Delete 5=Displa			21 Jan 2015
File	Key type	Key field name	Called pgm field	
PGNAME	*ALL		PGM1	

PGM1 field of **PGNAME** file is considered for variable program calls.

There are two options to specify the Key type –

*ALL: All the program names for the Called Program Field (i.e. PGM1) existing in the generic file (i.e. PGNAME) will be added as the program references.

***CONSTANT:** It works differently because it tracks the actual constant key value moved in the key field name for selecting the database records matching the key value for the variable call selection.

As an example, below are the entries in the **PGMNAME** file:



X-Analysis/4 XARWKGFS		Work with Generic Files	Databorough Ltd. 12:58:51 21 Jan 2015
-	s, press Enter. elete 5=Display		
COND	PGM1	PGM2	
000001 A 000002 B ****** *****	PG_V2K PG_V3K *** End of repor	PG_V1 PG_V4 t ******	

Considering the above setup and example, below program references are added once **XREFRESH** or the initialization process is executed on the X-Ref library:

X-Analysis/4 XARWKGFS	Work with Generic Files		ough Ltd. 8:51 2015
Enter options, press Enter. 2=Change 4=Delete 5=Display			
WHPNAM WHTEXT	WHFNAM	WHOBTP	WUSAGE
CL GEN PGM	PG V2K	P	I
CL_GEN_PGM	PG_V3K	P	I
***** ********************************	* * * * * * *		

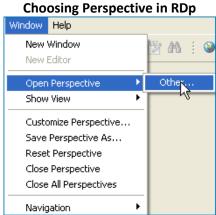
In this example, reference to **Generic Programs** has been deleted, and the references from relevant file/field listing on the "Work with Generic Files" screen has been added. The key type is specified as ***ALL** in the generic file entry. All the program names under the **PGM1** field of **PGNAME** file are considered as dependencies of **CL_GEN_PGM**. Therefore, the object dependencies of **PG_V5** are removed and the program names existing in **PGM1** field of **PGNAME** file are added as the dependencies of **CL_GEN_PGM** program. As a result, the Object Where Used displays the replaced dependencies.

Using X-Analysis Client

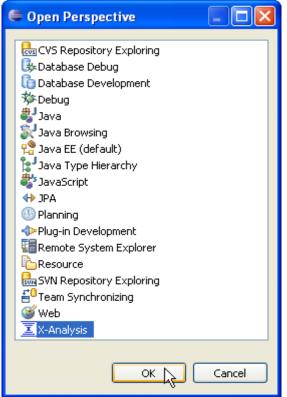
SIGN-ON DIALOG

Start IBM's Rational products 7.5 and above or Eclipse 3.4 and above. Select:

Window > Open Perspective > Other > X-Analysis



Selecting the X-Analysis Perspective





Click **OK** to start the X-Analysis Perspective.

)	(-Analysis Perspective	
۲			X-Analysis - Eclipse Platform – 🗖 🗙	
File Edit Navigat	te Search Project X	-Analy	sis Tomcat Run Window Help	
	- 9 • 9 • °		[™] → [™] ▲ [™] × [™] [™] [™] [™] × [™] [™] [™] × [™]	
Navigation Metr	ics Dashboard		- E	ןנ
	ction I 'New Connection' node ke Sign-on dialog]	Sign-on to X-Analysis Host Name [127.0.0.1 Username Password Use SSL Login Cancel	
 Session Information 	tion.			
Session Items	Description	^		
Host Name				
X-Analysis Usern		_		
X-Analysis Library Job Details				
		×		
		-		

Expand the **New Connection** node to bring up the Sign-on dialog.

X-Analysis Sign-on dialog

۲	Sign-on	to X-Analysis
	Host Name Username Password Use SSL	192.168.170.10 MARK
	Login	Cancel

Enter the following information to the **Sign-on** dialog:

- 1. Enter the TCP/IP address/Computer Name of the IBM i to be accessed.
- 2. Provide the username and the password of a valid IBM i profile.
- 3. Check the box for 'Use SSL' feature for additional security. For details, refer to Appendix K.
- 4. Click Login.

LEGACY

After successful sign on, X-Analysis lists the application libraries which were initialized using the **X4WRKAPP** command on the IBM i.

SESSION INFORMATION

The X-Analysis Client displays detailed session information about the connection in the associated Session Information view.

Session Information				
 Session Information. 				
Session Items	Description			
Host Name	192.168.170.10			
X-Analysis Username	MARK			
X-Analysis Library	XAN4CDXA			
Job Details	243943/QZDASOINIT/QUSER			
Database Library				
Application Area:				
Data Model Info.	Available			
Library List	XAN4CDXA XAN4CDEM QGP			

Session Information

The Session Information details are as follows:

- **Host Name:** Displays the IP or the web link of the connected IBM i.
- **X-Analysis Username:** Displays the user name which is connected to the IBM i.
- **X-Analysis Library:** Name of the cross-reference library, the user has currently selected.
- **Job Details:** Displays job details in format Job Number/Job Name/Job User.
- Database Library: The Subset Library which is being used to get the data from where the Data View options are selected. This displays a value only when a subset library has been selected.
- Application Area: Displays the currently selected Application Area.
- **Data Model Info:** Informs the user whether Data Modelling is available or not.
- **Library List:** Displays the library list for the current job.

X-ANALYSIS MENU

X-Analysis provides the **X-Analysis** toolbar menu on the Eclipse toolbar. The following screen displays options available on the X-Analysis menu:

X-Analysis Menu								
X-A	nalysis	Tomcat	Run	Window	Н			
3	License Manager							
	New DB400 Connection							
	New DB2 Connection							
	Mark all for Documenter							
	Change Application Folder							
	Open Log Folder							
	Open Application Folder							
	Authorize Google Drive							
	Report	an Issue						
	Install	SSL CA cer	tificate	2				

The details of the options provided by the X-Analysis menu are discussed as under:

LICENSE MANAGER

V2 is the new licensing mechanism which adds to the ease of both the new and existing X-Analysis users. Please contact Fresche Legacy at <u>license@freschelegacy.com</u> to obtain the license file.

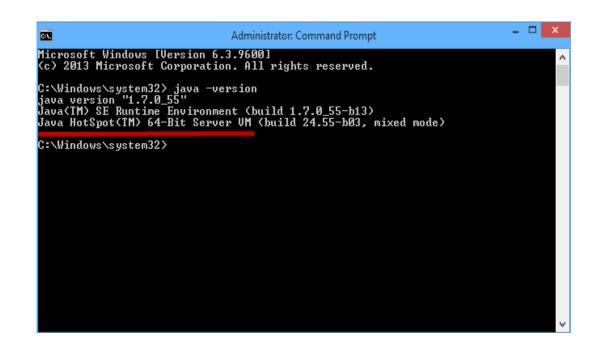
Obtaining the License File

Note: If you have already received the License File, please refer to <u>Applying the License</u> <u>File</u> section.

The initial step is to download the **XALicenseManagerTool**.

It is important to know if you need the 32 or 64 bit version for the License Manager Tool. Determine this by running the **cmd.exe** command "**java –version**." If, for instance, the "**64-Bit Server VM**" appears, then download the 64-bit version. See the screenshot below:





Select the appropriate version and click the corresponding link.

license.freschelegacy.com\XALicenseManagerTool_win32.win32.x86_64.zip
 license.freschelegacy.com\XALicenseManagerTool_win32.win32.x86.zip

The **XALicenseManagerTool** (according to your selected version) will be downloaded as seen in the image below.

🖟 l ⊋ 🚺 = l	Compressed Folder Tools	Downloads	- 🗆 🗙
File Home Share	View Extract		~ (
🔄 🌛 👻 🕇 🚺 🕨 This I	PC → Downloads	♥ 🖒 Search DownI	oads 🔎
🛠 Favorites	Name	Date modified Type	Size
Desktop	🔀 7z920x64	12-07-2011 18:31 Windows Installe	er 1,345 KB
Downloads	16584143450_b4b0bb09c9_o	23-03-2015 14:57 JPEG image	390 KB
Recent places	16584143450_e8526a31d9_m	23-03-2015 14:56 JPEG image	35 KB
	dmtempdownload7D9BC60588709B419A310	6 12-07-2011 18:31 TMP File	1,345 KB
🍓 Homegroup	Greenshot-INSTALLER-1.2.4.10-RELEASE	25-02-2015 14:05 Application	1,321 KB
	Nov. 2014 get-together_1	28-11-2014 19:46 JPEG image	70 KB
🖳 This PC	Nov. 2014 get-together_2	28-11-2014 19:46 JPEG image	93 KB
	Problem Analysis Detail	18-03-2015 11:28 PDF File	337 KB
📬 Network	XALicenseManagerTool_win32.win32.x86_64	02-04-2015 17:27 Compressed (zip	p 31,589 KB
	X-Analysis_Installation_&_Upgrade_Guide_10	0.2 13-11-2014 12:23 PDF File	735 KB
10 items 1 item selected 30	.8 MB		



Right-click on the downloaded **XALicenseManagerTool** compressed folder and click **Extract All** from the right-click menu.

🖟 l ⊋ 🕕 = l	Compressed Folder Too	ls	Downloads	-	×
File Home Share	View Extract				v ?
🔄 🌛 🝷 🕇 🚺 🕨 This P	C → Downloads		∨ Ċ Sear	ch Downloads	,o
☆ Favorites	Name		Date modified	Туре	Size
Desktop	XALicenseManagerTool_v	vin32.win32.x86 64	06-04-2015 13:08	File folder	
Downloads	7z920x64	-	12-07-2011 18:31	Windows Installer	1,3
🖳 Recent places	16584143450_b4b0bb09c9	_o	23-03-2015 14:57	JPEG image	
	16584143450_e8526a31d9	m	23-03-2015 14:56	JPEG image	
🍓 Homegroup	dmtempdownload7D9BC	60588709B419A3106	12-07-2011 18:31	TMP File	1,
	Greenshot-INSTALLER-1.	2.4.10-RELEASE	25-02-2015 14:05	Application	1,
👰 This PC	📔 Nov. 2014 get-together_1		28-11-2014 19:46	JPEG image	
	🔛 Nov. 2014 get-together_2		28-11-2014 19:46	JPEG image	
👊 Network	🔰 Problem Analysis Detail		18-03-2015 11:28	PDF File	
	🚹 XALicenseManagerTool_v	vin32.win32.x86_64	02-04-2015 17:27	Compressed (zipp	31,
	🖞 X-Analysis_Installation_&	Open	23	PDF File	
		Open in new w	vindow		
		Search Everyth	ing		
		Extract All			
		Pin to Start			
		👫 TortoiseSVN	•		
		7-Zip	•		
		Open with			
		Share with	•		
		Send to			
		Send to			
		Cut			
		Сору			
		Create shortcu	t		
		Delete			
		Rename			
11 items 1 item selected 30.	<	Properties			:== 🖿
Thitems Them selected 30.3		ropentes			8== 🖿

The following window will appear:



🔒 l ⊋ 🚯 = l	XALicenseManager	Tool_win32.win32.x86_6	54	-	□ ×
File Home Share	View				× 🕐
🔄 🌛 🔻 🕇 퉬 « Downl	oads → XALicenseManagerTool_wir	n32.win32.x86_64	✓ C	Search XALicenseManager	To 🔎
🚖 Favorites	Name	Date modified	Туре	Size	
🛄 Desktop) XALicenseManagerTool	06-04-2015 13:17	File folde	er	
Downloads Recent places Homegroup					
🖳 This PC					
📬 Network					
1 item					:== >

Double-click the XALicenseManagerTool file folder. The following window will appear:

🚺 💽 🚺 = I	XALicenseManagerTool		- • ×
File Home Share	View		v ()
🔄 🏵 🔹 🕇 📗 « XAI	LicenseManagerTo > XALicenseManagerTool	V 🖒 Search 🛛	KALicenseManagerTo 🔎
🔆 Favorites	Name	Date modified	Type Size
📃 Desktop	퉬 configuration	06-04-2015 13:08	File folder
🗼 Downloads	\mu plugins	06-04-2015 13:09	File folder
🗐 Recent places	\mu SAVF	06-04-2015 13:09	File folder
	.eclipseproduct	06-04-2015 13:08	ECLIPSEPRODUCT
🜏 Homegroup	XALicenseManagerTool	06-04-2015 13:08	Application
	XALicenseManagerTool	06-04-2015 13:08	Configuration sett
🌉 This PC			
🙀 Network			
	٢		>
6 items)== E

Now, double-click on the **XALicenseManagerTool** application (marked above) to invoke the **License Manager View**.



X-Analysis License Manager View

Ī	X-An	alysis License Manager Tool		- • ×
Help				
🔷 License Manager View 🛛				
1- Enter the login informatio	ons and Connect to retrieve the s	erver informations.		
Host Name	✓ Username	¥	Password	Connect
Use SSL				
Info Installed Licenses Secu	rity Code			
2- Send the Server Informati	ion to Fresche Legacy to receive	your License file.		
Server Info				
Serial Number:				
Partition ID:				
Total Partitions:				
Send Server Information	Copy to Clipboard			
2				

In the above view, provide the Host Name/IP address, Username and Password. Check the **Use SSL** box for the SSL security feature.

Click **Connect** to authorize the IBM i machine to provide the Serial Number and the Partition Number.

The following window displays the Progress Information.

Progress Information

C		X-Analysis License Mar	nager Tool	_ □
Help				
License Manager View 2	2			
1- Enter the login informat	ions and Connect to retrieve	the server informations	5.	
Host Name	V Usernam	e imistri	✓ Password ●●●●●●●●	Conne
Use SSL				
nfo Installed Licenses Sec	urity Code			
2- Send the Server In		Progress Informa	tion	
Server Info	Connecting to <	····· · ··· · ···		
Serial Number:				
Partition ID:				
Total Partitions:				
Send Server Inform				
			Cancel	

Once the connection is established, the following window is displayed:

C		X-	Analysis License	Manager Tool				- 🗆 🛛
Help								
🔷 License Manager Vie	w 🛙							
1- Enter the login infor	mations and Con	nect to retrieve th	ne server informat	tions.				
Host Name	1.00	✓ Username	-101104	~	Password	•••••		Connect
Use SSL								
Info Installed Licenses	Security Code							
2- Send the Server In			Progress Info	rmation				
Server Info	Ī		Informat	tion			×	
Serial Number:								
Partition ID:	() Server	connected						
Total Partitions:	· · ·							
Send Server Inform						ОК		
						U.K.		
							_	

5

LEGACY



Click **OK**. The Server Info will now show the Serial No., Partition ID, and Total Partitions.

License Manag	er window witl	h the Server Info
---------------	----------------	-------------------

Ī		X	Analysis License Mana	ger Tool			- 🗆 🗙
Help							
🔷 License Manager View 🛛							
1- Enter the login informatio	ns and Connect	to retrieve tl	ne server informations.				
Host Name	¥	Username	Dell I dell M	~	Password	•••••	Connect
Use SSL							
Info Installed Licenses Secu	rity Code						
2- Send the Server Informati	on to Fresche Le	gacy to rece	ive your License file.				
Server Info							
Serial Number:	1111021						
Partition ID:	6						
Total Partitions:	ii.						
Send Server Information	Copy to Clipbo	pard					
2							

You must wait to receive the License file by Fresche.

Click **Send Server Information** to send this information to the license team at Fresche prompting them to begin reviewing and processing the license request. An email will be automatically generated as is shown below.



Sample of the automatically-generated Outlook email

E = 5 0	↑ ↓ = X-Analysis V11 Request - License information - Message (HTML)	? 🖻 – 🗗 🗙
FILE MESSAGE	INSERT OPTIONS FORMAT TEXT REVIEW	
📇 🔏 Cut	Calibri • 12 • A* A* 🗄 • 🗮 • 🖉 🧶 🔮 🧞 🕛 💯 🍃 🕨 Pollow Up •	
Paste Copy		
💡 🚿 Format Pair	ter B I U V · A · E = = C · Address Check Attach Attach Signature V Low Importance Zoom	
Clipboard	rs Basic Text rs Names Include Tags rs Zoom	^
From +	projek B. Alexan (N.). Alexan (A.).	
Send To	license @freschelegacy.com	
Cc		
Subject	X-Analysis V11 Request - License information	
Telephone:	erReaseUpdateThisField> erReaseUpdateThisField> Serial number: Partition ID: 1 P. Group: P05 le modules: 1 2 3 4 5 6 7 8 9 10 Exp: 2038-11-30	

Click Send.

Alternatively, you can click **Copy to Clipboard**.

Ī		X-Analysis License	Manager Tool	- • ×
Help				
🔷 License Manager View 🛛				
1- Enter the login informatio	ons and Connect	to retrieve the server informa	itions.	
Host Name	~	Username	✓ Password ●●●●●●	• Connect
Use SSL				
Info Installed Licenses Secu	rity Code			
	ion to Fresche Le	egacy to receive your License	file.	
Server Info	The set of case of the			
Serial Number:	2111 HORE T			
Partition ID:	6			
Total Partitions:				
Send Server Information	Copy to Clipb	bard		
	3			

FRESCHE LEGACY

The information gets copied and is displayed as follows:

I X-Analysis License Manager Tool – 🗖 🗙											
Help											
🔷 License Manager View 🛛											
1- Enter the login informations and Connect to retrieve the server informations.											
Host Name	¥	Username		~	Password	•••••	Connect				
Use SSL											
Info Installed Licenses Security Co	de										
2- Send the Server Information to	Fresche	Solutions to	receive you	r License file.							
Server Info				lata marka		×					
Serial Number:				Information							
Partition ID:	Host	informatior	1 has been co	pied to clipboard	:						
Total Partitions:	/	Comp	any:	<pleaseupdate< td=""><td>ThisField></td><td></td><td></td></pleaseupdate<>	ThisField>						
Send Server Informatio		Custo Telepi	mer name:	<pleaseupdate< td=""><td>ThisField> aseUpdate</td><td>ThicEields</td><td></td></pleaseupdate<>	ThisField> aseUpdate	ThicEields					
		IP:	ione.	Serial number:		Partition ID: 1					
PGroup: P05 Security Code modules: 1 2 3 4 5 6 7 8 9 10 Exp: 2038-11-30											
No installed licenses.											
		INO INS	talled license	25.							
						OK					

Information displayed when clicking Copy to Clipboard

Click **OK** to automatically copy the information to the clipboard. Now you will simply need to paste the information or take a screenshot of the above window and email it to <u>license@freschelegacy.com</u> to get the License File.

Applying the License File*

Note: Proceed with installing the X-Analysis V11 client and server only when you have received the License File from support. Please store the new License file safely.

You can continue to use the old version till you receive the new file.

*The following steps are to be taken on Eclipse/Rational where X-Analysis is installed.

After you have received the License file, the next step is to install it. Select the **License Manager** option from the X-Analysis menu, as shown below.



X-Analysis menu – License Manager option

X-Aı	nalysis	Tomcat	Run	Window	Н
	License Manager				
	New DB400 Connection New DB2 Connection Mark all for Documenter Change Application Folder				
	Open Log Folder Open Application Folder			er.	
	Report	rize Google : an Issue SSL CA cer		2	

The **License Manager View** will be invoked. Browse and enter the License File path as shown below.

License Manager view with the License File path					
License Manager View S					
1- Enter the login informations and Connect to retrieve the server informations.					
Host Name Visername Visername Password ••••••• Connect					
Use SSL					
Info License Security Code					
2- Send the Server Information to Fresche Legacy to receive your License file.					
Server Info					
Serial Number:					
Partition ID:					
Total Partitions:					
Install License File					
License File:	all				
Reset Host License					

License Manager View with the License File path

Click **Install**. The Install log showing only the licenses included in the specified license file will appear.

Next, click the **License** tab to get a complete list of the installed licenses. It displays all information about the Product, Expiry Date, Status, Install Date, and License Type.



1- Enter the login information	ns and Connect to retrieve th	e server informa	ations.		
Host Name	✓ Username IIIIIIIIII	8	✓ Password ●●	•••••	Conne
Use SSL					_
nfo License Security Code					
Product	Expiry Date	Status	Install Date	License Type	
X-2E Analysis	Permanent	Valid	2015-02-15	Permanent	
X-2E Migrate	Permanent	Valid	2015-02-15	Permanent	
X-Analysis Lite	Permanent	Valid	2015-02-15	Permanent	
X-Archive	Permanent	Valid	2015-02-15	Permanent	
X-Audit	Permanent	Valid	2015-02-15	Permanent	
X-Control	Permanent	Valid	2015-02-15	Permanent	
X-DB Modernize	Permanent	Valid	2015-02-15	Permanent	
X-Datatest	Permanent	Valid	2015-02-15	Permanent	
X-Verify	Permanent	Valid	2015-02-15	Permanent	
XA-Open	Permanent	Valid	2015-02-15	Permanent	

The third tab is **Security Code** which displays any installed V1 modules based on the installed security code. In the absence of any security code, the page will display as empty as is seen in the following view.

		License ivia	nager view	– Secur	ity Cod	e	
🔷 License M	anager View 🛛						
1- Enter the	login informations and	Connect to retr	ieve the server inf	ormations			
Host Name	102-028-21-002	✓ Username	100 0 0000	Υ.	Password	•••••	Connect
Use SSL [
Info License	Security Code						
Expiry Date:	0001-01-01						
Module 1:	Not included						
Module 2:	Not included						
Module 3:	Not included						
Module 4:	Not included						
Module 5:	Not included						
Module 6:	Not included						
Module 7:	Not included						
Module 8:	Not included						
Module 9:	Not included						
Module 10:	Not included						

License Manager View – Security Code

Note: A <u>single license file</u> will be required, regardless of the number of partitions you may have for a given machine identified by its serial number.

Install the license file on each distinct partition. Follow the same installation procedure for each partition.

If you decide to clone a partition where XA 11.0 (and onwards) has already been installed/configured, install the license file on the newly-created partition in order for XA to start working on it.

New DB400 Connection

The X-Analysis menu provides the **New DB400 Connection** option. Through this option, you can create connections to different IBM i servers. Provide valid sign on information when you select the **New DB400 Connection** option. Upon successful sign on, X-Analysis adds a new IBM i node in the navigation view.

٢)	X-Analysis - Eclipse Platform
File Edit Navigat	e Search Project		Tomcat Run Window Help
	- Q - Q - 9		》 ▼ 品 ▼ 澄 格 誌 🛠 💘 殘 遢 🛛 🖹 堂 X-Analysis > ▼
Navigation Metrics Dashboard 192.168.21.102 New Connection			
			Sign-on to X-Analysis
			Host Name [127.0.0.1 Username MARK Password Use SSL
 Session Informat 	ion.		Login Cancel
Session Items	Description	^	
Host Name			
X-Analysis Usern			
X-Analysis Library			
Job Details		~	
<		>	4
₽			

Creating New DB400 Connection from X-Analysis Plugin

New DB2 Connection

The X-Analysis menu provides the **New DB2 Connection** option. By selecting this option, you can create connections to use offline X-Analysis. Provide valid DB2 sign on information when selecting the **New DB2 Connection** option.



•			X-Analysis - Eclipse Platform	- 🗆 🛛
File Edit Naviga	te Search Project	X-Analysis	Tomcat Run Window Help	
	- 9 - 9 - 4			∑ X-Analysis ava EE
Navigation Metr	ics Dashboard			- 8
📲 192.168.170.				
		۲	Sign-on to X-Analysis	
		<u> </u>	Host Name 127.0.0.1 DB2 Username MARK DB2 Password Use SSL	
			Login Cancel	
 Session Information 	tion.			
Session Items	Description	^		
Host Name				
X-Analysis Usern				
X-Analysis Library				
Job Details		~		
<		>		

Refer to **Appendix A** for more details on X-Analysis Offline.

Mark all for Documenter

Select the **Mark all for Documenter** option to mark all records for system documentation which are listed on the X-Analysis window.

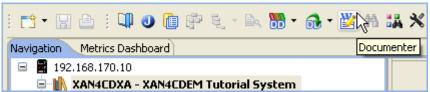


Mark all for Documenter option

X-Ar	nalysis	Tomcat	Run	Window	
	Licens	e Manager			
	New DB400 Connection				
	New D	B2 Connec	tion		
	Mark all for Documenter				
	Change Application Folder				
	Open	Log Folder			
Open		Application	n Folde	r	
	Autho	rize Google	e Drive		
	Report	an Issue			
	Install	SSL CA cer	tificate	2	

You can view the marked records through the **Documenter** icon on toolbar.

Documenter icon



On clicking the **Documenter** icon, the **Document Manager** dialog will display all the marked records.

Name	Туре	Description	Move Up
OEMENU	*PGM	Order Entry Menu 📃	Move op
CUSF	*FILE	Sites	
CBCONDET	*PGM	Work with Order Details	
CBCONDETNW	*PGM	Work with Order Details -?Long fields used	Move Down
CBCUSFMNT	*PGM	Customer Site Maintenance	
CBCUSTMNT2	*PGM	Customer Detail Maintenance -?Long fields usec	
CBCUSTS	*PGM	Work with customer - Cobol vers.	
CBC110	*PGM	Order Entry System	Delete
CBTRNHST	*PGM	Work with transaction history	
CB906R	*PGM	Back-out account	
CLET	*PGM	Build Customer Letter	
CLETN	*PGM	Print Customer Letter	Delete All
CNTCMAINT	*PGM	Contacts Maintenance	
CON001	*PGM	Contract Entry	
CPDM	*PGM	List Correspondence 🛛 🗸 🗸	Invert Selection
٢	· · · · · · · · · · · · · · · · · · ·		Invert Delection

Document Manager dialog

Change Application Folder

The default **Application Folder** for a specific application can be changed by selecting the **Change Application Folder** option from the X-Analysis menu (**X-Analysis>Change Application Folder**). The following dialog appears on selecting this option:

Change Application Folder

🖨 Sele	🖨 Select Application Folder 🛛 🔀				
?	Application Folder for XAN4CDXA is D:\Program Files\Databorough\X-Analysis\192.168.170.10\PCF_XAN4CDXA Do you want to change Application Folder for XAN4CDXA?				
	Yes No				

To select new Application Folder, click **Yes** in the dialog box. The following dialog appears prompting to specify location for the new Application Folder.

Browse For Folder	?×
Select Application Folder	
 i Desktop i My Documents ii I My Computer iii I My Network Places 	
Folder: My Documents Make New Folder OK Car	ncel

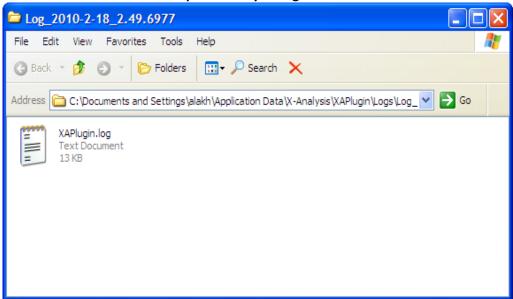
Select New Application Folder

Open Log Folder

This option opens the folder, currently used to record the log files of X-Analysis. The **XAPlugin.log** file can also be used for bug/error tracking. Select the **Open Log Folder** option from the X-Analysis menu (**X-Analysis > Open Log Folder**).



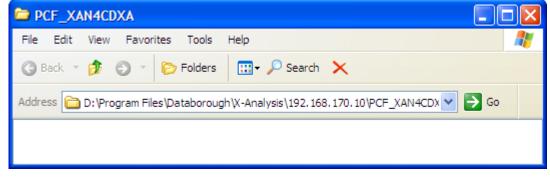
Open X-Analysis Log folder



Open Application Folder

Each application has its own Application Folder. This folder contains generated System Documents, Flowcharts, and DDL files. To view the Application Folder, select the **Open Application Folder** option from the X-Analysis menu (**X-Analysis > Open Application Folder**).





Authorize Google Drive

The **Authorize Google Drive** option authorizes you in exporting the DOCX or XLSX files to Google Drive. For more details, refer to <u>Appendix M</u>.

Report an Issue

The **Report an Issue** option helps you in reporting an issue along with the log files. When you select this option, X-Analysis collects all the information required to sort out the bug/error which is being reported and generates a zip file. X-Analysis then invokes the mail client installed on the user's system and attaches the zip file with this mail.

Install SSL CA certificate

The **Install SSL CA certificate** allows you to transfer data in a convenient and secure manner. For more details, refer to **Appendix K**.

X-ANALYSIS PREFERENCES

The X-Analysis **Preferences** provides the facility to modify product preferences.

The X-Analysis Plugin comes with default preferences settings. You can change default preferences settings as required. To change preferences settings, open **IBM's Rational product 7.5** and above or **Eclipse 3.4** and above.

From the menu bar, select **Window > Preferences** to invoke the **Preferences** dialog.

Treferences option					
M/*ALL/	*ALL/*ALL, Total O				
Window	Help				
New W	/indow				
New E	ditor				
Open I	Perspective 🕨 🕨				
Show	View 🕨				
Customize Perspective					
Save P	Save Perspective As				
Reset	Reset Perspective				
Close I	Close Perspective				
Close All Perspectives					
Navigation 🕨					
Prefer					

Preferences option

To view / modify various X-Analysis Preferences, select the X-Analysis node.

When you select the X-Analysis node, the following window is displayed:



	X-Analysis Preferences	
e	Preferences	- 🗆 🗙
type filter text	X-Analysis	→ → → →
General Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis XDoclet XML	General X-Analysis Preferences. IP Address User Case-sensitive or greater than 10 character Password Offline Mode Specify the DB2 port number in order to access offline X-Analysis of DB2 Port 50000 Begin with Outline Detailed DFD by default Show Re-engineered Screen for Screen/Report layout. Ignore Linked Repositories (if any) Open Called Procedure/Program source in same tab Open Data Flow Diagram in same tab Use Business Rules Overlay mode as default Use Source buffering Allow editing in Consolidated Rules Show only Objects in Metrics Restore Defaults	ross-reference
0	ОК	Cancel

Here is a detailed look at the X-Analysis Preferences for the X-Analysis Plugin:

- IP Address: Specify the IP address of the IBM i on which the X-Analysis server components are installed.
- **User:** Specify the username to sign on to X-Analysis.
- Case-sensitive Password: If the IBM i server is configured for case-sensitive passwords, i.e. QPWDLVL is 2 or 3, and then check this option. For QPWDLVL on the IBM i as 0 or 1, leave it unchecked. The default option is checked.
- **DB2 Port:** Specify the port number for the DB2 instance, where DB2 services must be running. DB2 Port will be enabled on offline IP address i.e. 127.0.0.1 or localhost. The default DB2 port is 50000.
- **User Interface:** Specify language for the X-Analysis user interface. The default language is English.
- Begin with Outline: Specify appropriate settings for the Outline Pane (View Pane). The default option is unchecked, which means that the Outline Pane will not be

displayed automatically. The outline or any other view will be displayed only when asked for.

- Detailed DFD by default: Check this option to invoke detailed data flow diagram as default.
- Show Re-engineered Screen for Screen/Report layout: Check this option to view the re-engineered screen for Screen/Report layout. When not selected, the Screen/Report layout shows the green screen display. This is the default setting.
- **Ignore Linked Repositories (if any):** Check this feature to ignore linked repositories. The default option is unchecked.
- Open Called Procedure/Program source in same tab: Uncheck this option for not opening Called Procedure or program source in the same tab. The default option is checked.
- **Open Data Flow Diagram in same tab:** The default option is checked. Uncheck this box to force any DFD selected from within another Data Flow Diagram to open in a new editor. Currently such DFDs are drawn on the same editor.
- Use Business Rules Overlay mode as default: Check this option to set the Business Rules Overlay mode as default.
- **Use Source buffering:** Check this option to enable source buffering.
- Allow editing in Consolidated Rules: Check this option to make changes in the Consolidated Rules.
- Show only Objects in Metrics window: While listing metrics, when the relevant box is selected, then the metrics is shown for all items which actually have an object in the user's library(ies). When the box is left unselected, it also includes the source members which do not have any objects associated with it.

ADVANCED PREFERENCES

Expand the X-Analysis node to view/modify the Advanced Preferences.

e	Advanced Preferences Preferences	- 🗆 🗙
type filter text	Advanced	⇔ • ⇔ • •
General Ant	Advance Setting Preferences.	
Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis Advanced Folders General	 Work with Objects Default File Attribute Default Program Attribute Subset Data Include Owners Include All Dependents Replicate Triggers/Constraints Data Option Search Settings Occurrence UML Diagram 	PF V *ALL V *YES V *NO V *NO V *REPLACE V
X-Data Test X-Redo	✓ Synon Data Flow Diagram Use old logic for Synon DFD	
XDoclet XML	Database Language Translation No	Translation requirec V Defaults Apply
0	ОК	Cancel

Advanced Preferences

You can modify the following Advanced Preferences for the X-Analysis Client:

Work with Objects:

- **Default File Attribute:** Specify attribute for Object List of ***Files**. The default value is 'PF'.
- **Default Program Attribute:** Specify attribute for Object List of ***PGM**. The default value is **'***ALL'.

Subset Data:

- Include Owners: The default value is ***YES**.
- Include All Dependents: The default value is ***NO**.
- **Replicate Triggers/Constraints:** The default value is ***NO**.
- **Data Option:** The default value is ***REPLACE**.

Search Settings:

- **Occurrence:** Select the appropriate search setting from the drop-down box. You will view the streamlined content based on this selection. If no selection is made, then the default search setting will apply.
- **UML Diagram:** Check the **Show object name in Class diagram** box to see the object name in the Class Diagram.
- Document Generation: The Use MS Word OLE Automation box is unchecked by default. Checking the box activates OLE Automation allowing greater flexibility in handling data during the document generation process.
- Diagram Export: The Use Open Office Draw for 64-Bit box is unchecked by default. Check the box to use Open Office Draw for exporting diagrams more efficiently in 64bit machines. If the box is left unchecked, the diagrams will be exported in the default format.
- Synon Data Flow Diagram: When the Use old logic for Synon DFD box is checked, then the Synon DFD uses the older logic of reading the references from X2EPGRF. When the box is not checked, the new logic is used. In the latter case, you must have the latest server.
- Database Language Translation: This allows French users to select 'Database Translation Language', which enables correct display of French characters in the X-Analysis Client software.

FOLDERS PREFERENCES

Expand the X-Analysis node to view/modify the Folders Preferences.

	Folder	s Preferences
Preferences		
type filter text	Folders	⇔ • ⇔ • ◄
 General Ant Data Management Help Install/Update Java JavaScript JPA Model Validation Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Tomcat UML2 Diagrams Usage Data Collector Validation Web Web Services X-Analysis General X-Data Test X-Redo XDoclet XML 	* X-Analysis Pers Specify folder	D:\Program Files\Databorough\X-Analysis ary files folder d have the write/modify authority to the selected folder. pective should be closed for this to take effect. Browse
0		OK Cancel

Folder Preferences:

- X-Analysis Folder: Specify path for the X-Analysis folder.
- Logs and Temporary files folder:
 - **Specify Folder:** Specify location to change the default location for the X-Analysis logs and temporary files. If this is left blank, then default location is set.

Open Office Installation Path:

• **Specify Folder:** Specify location to change the default Open Office Installation path. If this is left blank, then default location is set.

GENERAL PREFERENCES

Expand the X-Analysis node to view/modify the General Preferences.

•	Preferences	- 🗆 🗙
type filter text	General	⇔ • ⇒ • •
type filter text General Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis Advanced Folders General X-Data Test X-Redo XDoclet XML	General Setting Preferences. Structure Chart Maximum Diagram Depth Maximum Unexpanded Depth Maximum Files to show in a row in 'Show Files' mode Preferred Volume Limit System Document & View Export as OPDF MS Word document Google Drive Export Allow Export to Google Drive as DOCX Allow Export to Google Drive as XLSX Program Structure Chart Default View Level 13 Number of records to dis Variable Where Used Default View Level 1 Object Where Used Intry Level References 7 Default Source Editor Lpex S250 Emulator Others 	14 ✓ 10 ✓ 5 ✓ 1000 Paper Size ● A4 ○ Letter
	Number of records to display 1000 Restore I	Defaults Apply
0	Restore I OK	



Structure Chart

LEGACY

- **Maximum Diagram Depth:** The Interactive Structure Chart can be displayed up to 14 levels. Select appropriate level for the interactive Structure Chart. The default level is 14.
- **Maximum Unexpanded Depth:** This sets the maximum depth up to which the SCD will be displayed as expanded. The data for further levels will be fetched, but shown as collapsed initially. The default level is 10.
- **Maximum Files to show in a row in 'Show Files' mode:** The Interactive Structure Chart can display up to 10 files in a row. Select appropriate value for files to be displayed. Value ranges from 1-10. The default value is 5.
- Preferred Volume Limit: The Interactive Structure Chart gets displayed according to the volume limit set / provided in this field. The default limit is 1000.

System Document & View Export as

- **PDF:** The **PDF** option is checked by default. It implies that System Document will be generated as PDF document. Also, all list/view/diagram exports will be as PDF.
- MS Word Document: Select this option to generate System Documents in MS Word format. Also then all the subsequent exports will be in MS Word document.

Paper Size

- **A4:** The **A4** option is checked by default. It implies that the print paper size will be A4.
- Letter: Choose Letter as paper size for printing.

Google Drive Export

- Allow Export to Google Drive as DOCX: Check this option to allow Google Drive export in the DOCX format.
- Allow Export to Google Drive as XLSX: Check this option to allow Google Drive export in the XLSX format.
- Program Structure Chart
 - **Default View Level:** Program Structure Chart can be displayed up to 20 levels. Select appropriate level. The default level is 13.

Variable Where Used

FRESCHE LEGACY

• **Default View Level:** Variable Where Used can be displayed up to 6 levels. Select appropriate level. The default level is 1.

Object Where Used

• **Entry Level References:** The Entry Level References need to gather information about calling program and then, in turn, calling program of calling program. This setting specifies the number of maximum recursions made while querying for the calling program. The default level is 7.

Default Source Editor

- **LPEX:** LPEX editor is checked by default for IBM Rational products having RSE plugin. It implies that the source member will be displayed in LPEX editor for editing purpose.
- 5250 Emulator: 5250 Emulator is the default option for non-RSE plugin. It implies that the source member will be displayed in a 5250 session for editing purpose.

Others

• **No. of records to display:** Displays the total number of records to be displayed in any *FILE object when the **View Data** option is executed.

X-DATA TEST PREFERENCES

Expand the X-Data Test node to view/modify the X-Data Test Preferences.



E Server	↓ ↓ ⇒ +
Ant Data Testing Data Management Data Management Java specific version Java specific version Java specific version Java specific version Default Recording Mode Java Java Default Recording Mode Okeys Only Model Validation Plug-in Development Remote Systems Remote Systems Remote Systems Ant Server Server Service Policies	
Team Tomcat UML2 Diagrams	100% t new Screen Test projects. om source (recorded image) to target image (screen)

X-Data Test Preferences

You can modify the following X-Data Test Preferences:

Screen Testing

- **Default Recording Mode (Radio button):** Select one of the following methods:
 - Keys Only: Only entries by computer's keyboard are recorded.
 - Mouse Only: Only entries through computer's mouse are recorded.
 - Mouse and Keys: Both keyboard and mouse entries are recorded. This is the default option.

X-REDO PREFERENCES

Expand the X-Analysis node to view/modify the X-Redo Preferences.

	X-Redo	Preferences		
٢	Pr	eferences		- 🗆 🗙
type filter text	X-Redo			⇔ • ⇔ • •
General Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis Advanced	General X-Redo Pref Web Server Folder Web URL Grid Display Show 5250 Grid	C:\Program Files\To 127.0.0.1 Labels display in the Grid on the Web page c Precision options	omcat	Browse *DEFAULT *
Web Web Services X-Analysis	Function Level Log			● Public
0			Restore Defau	lits Apply Cancel

You can modify the following X-Redo Preferences:

- Web Server Folder: Specify the path for the Web Server folder. You may specify the Tomcat folder other than the one installed by X-Redo installer.
- Web URL: Specify the X-Redo URL for its execution. The default value is 127.0.0.1. You may change the Tomcat port to use.

- **Grid Display:** These configure the grid presentation.
 - Show 5250 Grid Labels (Checkbox): The default value is checked.
 - **No. of rows to display in the Grid (Drop-down):** This is used to set the default number of rows to display in a grid. The default value is ***DEFAULT**. You can override the default rows to show by setting the number of rows to show on each grid.
- Site Date Format: This is used to set the default date format settings for the generated web pages. You may select the required date format to use on the generated web pages to show and receive the dates.
- Numeric Precision:
 - **Higher Numeric Precision:** Selecting this option would use the BigDecimal data type instead of Double data type.
- Package Naming options (Radio button):
 - **Project Name:** Name of the project as specified on the **Generate Programs** dialog (by default). This is used as the first part on the package names created in the project.
 - **Application Area Name:** If selected, the application area name is used as the first part on the package names created in the project.
 - **Package Prefix Only:** Selecting this option would only use the value in 'Package Prefix' as the prefix for the package name without appending Project/Application Area Name.
- Function Level Logging: This controls the logging statements to include on the generated code. By default 'None' is set i.e. no logging. 'Trace' includes the Entry and Exit statements into the 'Public' functions (by default). Selecting 'Debug' includes the statements to log values of the entry parameters when entering a 'Public' function and their values when exiting the function. These are in addition to the Entry and Exit statements generated by the 'Trace' option. For 'Trace'/'Debug' mode, you may select 'All' to log all the functions the control enters and exits at the runtime.

X-REDO ADVANCED PREFERENCES

Expand the X-Redo node to view/modify the X-Redo Advanced Preferences.



X-Redo Advanced Preferences

.		Preferences	- • ×
type filter text		Advanced	↓ ↓ ⇒ ▼
Remote Systems	^	Advanced X-Redo Preferences.	
Run/Debug		Page Designer	
 Server Service Policies 		Design Page using	Eclipse 🗸
> Tasks		besign by early	compac
> Team		Generate WAR/EAR	
Tomcat		Generate Separate UserLogicClass	
b UML2 Diagrams		Generate Java to use with Other Databases	
b Usage Data Collector		Suppress try/catch Statements in Logic Classes	
Validation		Unique Component ID	
b Web			
b Web Services			
▲ X-Analysis			
Advanced Folders			
General			
X-Data Test			
⊿ X-Redo			
Advanced			
> XDoclet			
⊳ XML	~	Restore	Defaults Apply
0		С	K Cancel

You can modify the following X-Redo Advanced Preferences:

- Page Designer: Option to design page using either Eclipse or Dreamweaver. By default, Eclipse is chosen.
- Generate WAR/EAR: When checked, this includes a right-click option Generate WAR/EAR on the X-Ref and application area.
- Generate Separate UserLogicClass: Check this option to generate separate UserLogicClass.
- Generate Java to use with Other Databases: Check this option to generate Java to use with the other databases.
- Suppress try/catch Statements in Logic Classes: Check this option to suppress try/catch statements in Logic Classes.
- Unique Component ID: Check this box to prefix the JSF Component IDs with the program names so that they are distinguishable when XHTML files are merged.

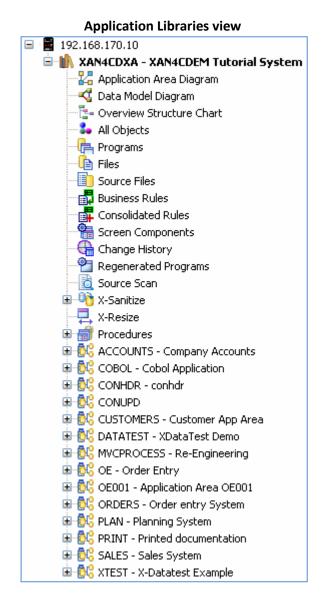
Preference changes will take effect for the new X-Analysis Instance.



Application Library

WORK WITH APPLICATION LIBRARIES

The Application Libraries view is the first X-Analysis view. It lists all the applications added using the **X4WRKAPP** command.



APPLICATION LIBRARY MENU OPTIONS

È

Select the cross-reference library and opt for the context menu which displays the following pop-up menu:

	Context menu for the X-Ref
	New Application Area
	Add Alternate Data Library List
	Reset Library List
	Application Library List
	Affinity Comparison
	Refresh Options
	Derive Business Rules
2	Import Options
	Export Options •
	Document Entire Application
	Document Changed Objects
	Reengineer Programs
	Generate Programs
	Generate Web Services
	Generate Data Application
	Data Migration
	Inter-Repository Options
	Audit Options

NEW APPLICATION AREA

X-Analysis creates an application area from part of one or multiple systems. It is possible to programmatically subdivide an application into logical modules or areas. For more details, refer to the **Application Area** section.

ADD ALTERNATE DATA LIBRARY LIST

The library list changes accordingly when you select a cross-reference library. This library list contains cross-reference library, data library, QGPL, QTEMP, and XAOBJ.

When you select the **View Data** option on a PF or LF, then data is displayed from the data library mentioned in the library list. X-Analysis provides a feature called **Alternate Data**



Library List if you want to use a data library other than the ones mentioned in the library list.

The **Add Alternate Data Library List** option is available on the right-click menu of a crossreference library. It provides a method of inserting a library or a group of libraries into the data portion of the library list. This gives a name to a group of libraries that can be maintained by the **Work with Alternate Data Library List** option discussed below.

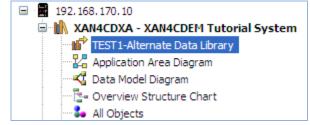
On selecting the Add Alternate Data Library List option, the following dialog appears:

	Elliale Data Library Glaio	5
🖨 Add Alte	ernate Data Library List	×
Name	TEST1	
Description	Alternate Data Library	
	OK Cancel	

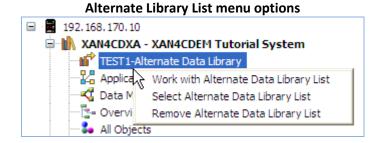
Add Alternate Data Library dialog

Provide a name and description for the alternate library group in the above dialog box. Click **OK** to add the alternate data library group name under the cross-reference library node shown below:

Alternate Library List added to the cross-reference library



Expand the cross-reference node and select the **Alternate Data Library** node. Then, opt for the context menu as displayed below:



Add Data Library (ies) to the Alternate Data Library List

To add data library (ies), select the **Work with Alternate Data Library List** option from the right-click menu of the **Alternate Data Library List**. The **Work with Alternate Data Library List** invokes the following dialog:

	alaiog
🖨 Add Alternate Data Library List - TEST1	×
Library	Move Up
	Move Down
	Delete
	ОК
	Cancel
Library Add To List	

Work with Alternate Data Library List dialog

Fill in the name of the data library as desired and click **Add To List**. This will add the data library in the **Library** section of the dialog. You can add more data libraries in the similar manner.

The **Work with Alternate Data Library List** dialog provides the following options for the libraries added:

- Move Up moves the specific library name to a higher position in the list.
- Move Down moves the specific library name to a lower position in the list.
- **Delete** removes the library name from the list.
- **OK** proceeds to the further process and closes the dialog box.
- **Cancel** closes the dialog box.

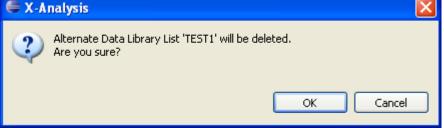
Select the Alternate Data Library List

The **Select Alternate Data Library List** option is used to select the Alternate Data Library. On selecting the option, the Library List is modified by replacing the Data Library from the user part of the Library List with Alternate Data Library/(ies) in the user part of Library List.

Remove Alternate Data Library List

Select the **Remove Alternate Data Library List** option to remove the Alternate Data Library from the cross-reference library. It will invoke the following confirmation dialog:

Confirmation dialog on removing Alternate Library List X-Analysis



Click **OK** to remove the Alternate Data Library. Click **Cancel** to cancel the option.

Reset Library List

When a cross-reference library is selected, the Library List changes accordingly. This Library List contains cross-reference library, data library, QGPL, QTEMP, and XAOBJ.

You can change this set of Library List by using the **Add Alternate Data Library List** option. After the Alternate Data Library is set up, select the **Select Alternate Data Library List** option to modify the Library List of the cross-reference. If you want to use the previous Library List (original Library List at the time of cross-reference selection), select the **Reset Library List** option.

The **Reset Library List** option is available on the right-click menu of a cross-reference library. On selecting Reset Library List, the Library List is modified by removing the Alternate Data Library(ies) from the user part of the Library List and restoring the original Data Library(ies) to the user part of the Library List.

The Reset Library List option gets enabled only when the Select Alternate Data Library List option is selected from the right-click menu of the Alternate Data Library List.

Application Library List

The Application Library List is used to view/update the list of object and source libraries for the selected cross-reference. This feature allows you to add or remove any library or even change the sequence number. However, you need to re-initialize to see the effect after changing the application library list. To view/change the application libraries, opt for the context menu on the application library and select the **Application Library List** option. The following dialog is displayed:



	Applica	tion Library List	dialog	
Application L	ibrary List			
	N4CDXA N4CDEM Tutorial Syst	em Move Up Move Down Modify Remove	Source Library(s) XAN4CDEM	
Library Name	Type	ect Library	~	Add
			Cancel	

The **Application Library List** dialog displays the list of libraries for the selected cross-reference library. You can add new libraries to the existing cross-reference library list. Provide a valid library name in the **Library Name** text box and choose the appropriate **Type** for the added library from the drop-down (it could be an object, a source, or a model library). Then click **Add** to add the library to the existing library list. Re-initialize the cross-reference library to see the change.

Affinity Comparison

The **Affinity Comparison** option is allowed on the X-Ref library as well as an application area.

The **Affinity Comparison** option at the X-Ref library displays all the objects belonging to one or more application areas along with the affinity comparison of those objects.

In the following window, the rows display the objects which exist on one or more application area, whereas the columns display the names of all the application areas belonging to the X-Ref library.

X-Analysis User Manual 11.1



Affinity Compar	ison for XAN4C	DXA							관
Programs	ACCOUNTS	ACHEAD01	BCHEAD01	COBOL	CONHDR	CONUPD	CUSFMAINT	CUSTOMERS	1
CB906R	10	0	0	0	0	0	0	0	
CNTCMAINT	10	0	0	0	0	0	10	10	ſ
RTNMSGTEXT	10	0	0	0	10	0	10	10	
X@GSCD	10	0	0	0	10	0	10	0	
CONUPD0	0	0	0	0	0	0	0	0	
CONUPD1	0	0	0	0	0	0	0	0	
CONUPD2	0	0	0	0	0	0	0	0	
CON001	0	0	0	0	0	0	0	0	
CUSCPY	0	0	0	0	0	0	0	0	
CUSFMAINT	10	0	0	0	48	0	48	20	
CUSFMOLD	10	0	0	0	20	0	20	20	
CUSFSEL	0	0	0	0	20	0	20	20	
CUSGRSEL	0	0	0	0	20	0	20	20	
CUSLETSQ	0	0	0	0	14	0	14	0	

Affinity Comparison window for XAN4CDXA

REFRESH OPTIONS

The submenu has the following options:

- Initialize Cross-Reference
- Refresh Cross-Reference
- Rebuild Data Model
- Repository Refresh Log

Initialize Cross-Reference

The **Initialize Cross-Reference** option initializes the cross-reference library to reflect the changes made to the cross-reference library. Select the option from the **Refresh Options** submenu on the context menu of the cross-reference library. The following dialog is displayed on selecting this option:

Confirmation dialog for Initialize Cross-Reference option

🖨 X - J	Inalysis	
?	Initializing Cross-Reference XAN4CDXA Do you wish to proceed?	
		Ves No

LEGACY

Click **Yes** to submit a new batch job for initializing the cross-reference library.

The batch job processing on the server is displayed as below:

Initialize Cross-Reference – Job Log view	
Initialize Cross-Reference - Log	×
Initialize Cross-Reference	
Command: SBMJOB CMD(XA4INIT):XRFLIB(XAN4CDXA) LIBRARIES(XAN4CDEM SRCLIBS(XAN4CDEM)INLLIBL(XAOBJ QGPL QTEMP) CCSID(*SYSVAL) JOB(XA4 Library List: XAOBJ QGPL QTEMP	· · · · · · · · · · · · · · · · · · ·
Job Log	
- Mon Mar 02 14:52:45 IST 2015: XA4INIT XRFLIB(XAN4CDXA) LIBRARIES (XAN4CDEM) SRCLIBS(XAN4CDEM)	^
	~
	ОК

Note: The Initialize Cross-Reference option gets enabled only for the new cross-reference application.

Refresh Cross-Reference

The **Refresh Cross-Reference** option refreshes the cross-reference library to reflect any changes that have been made to the cross-reference library. This option only refreshes the sources and objects that have already been initialized; it will not look at the freshly-added or deleted sources and objects.

Select the **Refresh Cross-Reference** library option from the **Refresh Options** submenu on the context menu of the cross-reference library.



	Context menu option for Refre	esh (Cross-Reference
Navigation Met	rics Dashboard		
A 🐘 XAN4C	DXA - XAN4CDEM Tutorial System		
	New Application Area Add Alternate Data Library List Reset Library List Application Library List Affinity Comparison		
	Refresh Options	►	Refresh Cross-Reference
	Derive Business Rules		Rebuild Data Model Repository Refresh Log
	Import Options Export Options	•	

The following dialog is displayed:

Refresh Cross-Reference dialog

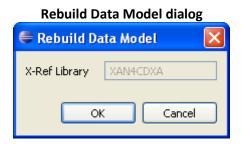
🖨 Refresh Cr	oss-Reference 🛛 🔀
X-Ref Library	XAN4CDXA
0	Cancel

Click **OK** to execute a batch job and refresh the cross-reference for any changes.

This action locks X-Analysis Plugin. After the Refresh process is over, the lock on X-Analysis Plugin is released.

Rebuild Data Model

Select the **Rebuild Data Model** option to bring up the **Rebuild Data Model** dialog.



Click **OK** to unselect the application and submit the modelling command in batch mode. The process locks the application.

Repository Refresh Log

The **Repository Refresh Log** view displays list of commands executed over the selected cross-reference library. Select the option from the **Refresh Options** submenu on the context menu of the cross-reference library.

David a Stanie - Dafua ale I a a

Repository Refresh Log					
🔁 Repository Refresh Log 🛛					
Repository R	efresh Log of 🕻	XAN4CDXA	a 🤉 -	e e e e e e e e e e e e e e e e e e e	₩ -
Run Date	Run Time	Program Executed	Notes	User Id	^
2012-12-20	12:56:52	XREGEN	*ALL programs	US	
2012-12-20	12:50:25	XREGEN	*ALL programs	US	
2012-12-20	12:40:36	XREGEN	*ALL programs	US	
2012-12-20	12:11:54	XREGEN	Program: WWCUSTS	DVERMA	
2012-12-14	07:57:03	XREFRESH	XREFRESH Processing	US	
2012-12-14	07:38:02	XREFRESH	XREFRESH Processing	US	
2012-12-03	17:48:04	XREFRESH	XREFRESH Processing	US	
2012-11-29	12:53:39	XREGEN	Area: MVCPROCESS	US	
2012-11-29	12:51:43	XGENBRULES	Area: MVCPROCESS	US	
2012-11-29	11:46:19	XREGEN	Program: CUSTMNT1	TESTER	
2012-11-29	11:46:00	XGENBRULES	Program: CUSTMNT1	TESTER	
2012-11-29	10:53:04	XREGEN	Area: MVCPROCESS	US	
2012-11-29	10:51:17	XREGEN	Area: MVCPROCESS	US	
2012-11-29	10:28:16	XGENBRULES	*ALL programs	US	
2012-11-29	10:24:01	XREFRESH	XREFRESH Processing	US	
2012-11-29	10:12:25	XGENBRULES	Program: CUSFMAINT	US	
2012-11-29	10:06:48	XGENBRULES	Area: MVCPROCESS	US	
2012-11-27	14:03:32	XGENBRULES	*ALL programs	US	
2012-11-22	06:31:28	XDMODEL	*BOTH *PREFIX	US	
2012-11-05	06:41:22	XREGEN	Program: AH0040	ANURUDHD	
2012-11-05	06:41:16	XGENBRULES	Program: AH0040	ANURUDHD	~

The log contains information about the user who executed a command and its date and time details. Only the following commands were reported:

- Application Initialization (XA4INIT)
- Data Model Generation (XDMODEL)
- Business Rules Extraction (XGENBRULES)
- X-Resize Initialisation (XRESIZE)
- Application Refresh (XREFRESH)

DERIVE BUSINESS RULES

The **Derive Business Rules** option is available on the context menu over the application library, an application area, and on an individual ***PGM** type object of **RPG/RPGLE** or **CBL** attribute. For more details, refer to the Business Rules Analysis section.

IMPORT OPTIONS

The **Import Options** submenu has the **Application Area using Excel Sheet** as the only option. Select the option to open a dialog box. Browse for the pre-defined format of the Excel document.

Note: The pre-defined format for the Excel sheet is available in the 'template' folder on the location where X-Analysis is installed.

٢		Ope	en		×
🔄 🏵 🝷 🕇 📕 «	X-A	nalysis 🕨 template	× Ċ	Search template	Q
Organize 👻 New 🕯	folder			-== -==	• 🔲 🔞
 ★ Favorites ■ Desktop ↓ Downloads ∑ Recent places ♦ Homegroup ↓ This PC ♥ Network 		Name AppAreaRulesFormat	Date modified 30-01-2015 14:13	Type Microsoft Excel	Size 10 KB
F	ile nan	ne: AppAreaRulesFormat	¥	*.xlsx Open	✓ Cancel

Template folder containing the Excel document

The image of the format is shown below:



	🖯 🏷 d	≥			AppAreaRule	sFormat [Compa	tibility Mode] - Excel			? 📧	- 6	
ILE	E HOME	INSERT PAGE LAYO	UT FORM	IULAS DATA	REVIEW VIEW					Shilpi	i Khan ≁	1
-	🔏 🛛 Arial	~ 10 ~ A*	_ = =	- »· 🗗	Wrap Text G	eneral	- 🛃 🛛			utoSum * Arr		
ste	B	I U - 🖾 - 👌 - 🛕				<u>-</u> % , 58	.00 Conditional Form	at as Cell	Insert Delete Format	Sort & Find &		
• pb·	oard 5	Font	6	Alignment	G.	Number	Formatting Tab		v v v 🧹 Cl Cells	ear* Filter* Select* Editing		
6	Ŧ	$\times \checkmark f_x$										
	А	В	С	D	E	F	G	н	1	J		
	pp Area ESTAREA1	Description My Test Application Area 1		Object Type (P/F) P	Comparison (EQ/NE) EQ	Object Name WWCUSTS	Lib Comparison (EQ/NE)	Lib Name	Inc. Ref. Pgms (Y/N/A/B/S/U/V Y) Inc. Ref. Files (Y/N/U/A/V) Inc. Ov	w
	ESTAREA2	My Test Application Area 2	S	F	EQ	CUSTS			A			
		My Test Application Area 2		P P	EQ	CUSTMNT1						
Ľ	ESTAREA3	My Test Application Area 3	18	P	EQ	CUSTMNT1			A			
H												

1 -1-

The data loaded from the Excel document can be viewed in the Application Area Rules editor window on Eclipse as shown in the following image:

App Area	Rules	editor	window
----------	-------	--------	--------

Application Area Ru	les for XAN4CDXA			R.		# -
Application Area	Description	Select/Omit	Object Type	Comparision	Object Name	Lib Com
TESTAREA1	My Test Application Area 1	S	Р	EQ	WWCUSTS	
TESTAREA2	My Test Application Area 2	S	F	EQ	CUSTS	
TESTAREA2	My Test Application Area 2	0	Ρ	EQ	CUSTMNT1	
TESTAREA3	My Test Application Area 3	S	Р	EQ	CUSTMNT1	
<						>

Right-click on the required row to delete the entries; save the changes by clicking the Save icon marked in the above image.

EXPORT OPTIONS

This submenu has the following options:

- Export as DDL
- Export as Web Query Metadata

- Export as Web Query Application
- Export Business Rules as XML
- Convert DDS to SQL
- Generate Database Service Programs
- Export CRUD Spreadsheet (available only for application areas)

Export as DDL

The **Export as DDL** option exports Data Model information as Data Definition Language to the application folder. This information may be used by any database management system e.g. Oracle or SQL server to create a similar data model. For details, refer to the Export as DDL from X-Analysis section.

Export as Web Query Metadata

The Web Query Metadata files are generated using the **XWBQMET** command. These files can be used in IBM's DB2 Web Query Tool.

Export as Web Query Application

The Web Query Report files are generated using the **XWBQRPT** command. These files can be used in IBM's DB2 Web Query Tool.

Export Business Rules as XML

The **Export Business Rules as XML** option generates an XML file which has details of all the business rules of the selected application/application area. Select the option to display the following dialog:

Export Business Rules as XML				
This may take time. Do you want to continue?	Cancel			

Export Business Rules as XML dialog

After the processing is complete, the following information dialog is displayed:



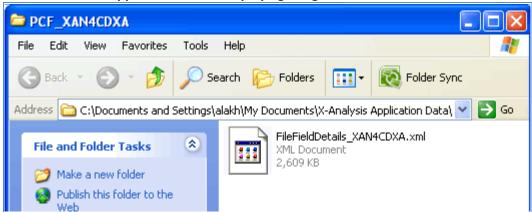
To view the generated XML file, open the application folder as displayed below:

🛢 X-Analysis - Eclipse Platform 🗕 🗖 🗙					
File Edit Navigate Search Project	X-Analysis Tomcat Run Window Hel	p			
📑 🗝 🗈 🛛 🔍 🔂 👘 👎	License Manager	💐 😼 📓 🛛 🔡 🔟 X-Analysis			
🌯 🔹 😥 🔗 👻 🧏 👻 🖗 🔹	New DB400 Connection	및 <mark>》</mark> Java EE			
Navigation Metrics Dashboard	New DB2 Connection				
▲ 192.168.170.10	Mark all for Documenter	^			
XAN4CDXA - XAN4CDEM Tur 2 Application Area Diagram	Change Application Folder				
式 Data Model Diagram	Open Log Folder				
All Objects	Open Application Folder				
🕞 Programs 👔 Files	Authorize Google Drive				
Source Files Business Rules	Report an Issue Install SSL CA certificate				
Consolidated Rules					

Open Application Folder option

The following screen displays the Application Folder listing the generated XML file.

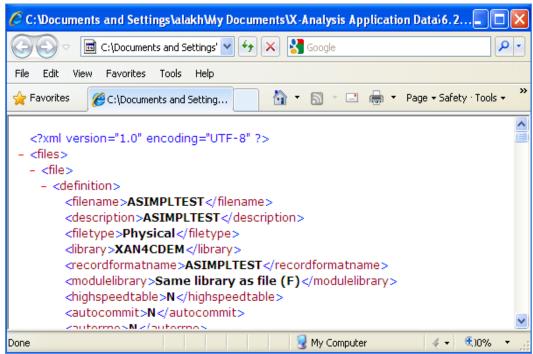
Application Folder displaying the generated XML file



Open the generated XML file in Internet Explorer or any other suitable editor.



Generated XML File



Convert DDS to SQL

The **Convert DDS to SQL** option calls the **XDDSTOSQL** IBM i command and submits the job in batch. For details, refer to the Convert DDS to SQL section.

Generate Database Service Programs

The **Generate Database Service Programs** option calls the **XWRTDBSP** IBM i command and submits the job in batch. For details, refer to the Generate Database Service Programs section.

DOCUMENT ENTIRE APPLICATION

Refer to the Document Manager section.

DOCUMENT CHANGED OBJECTS

The **Document Changed Objects** option documents those objects which have changed since the last initialization was run on the cross-reference library. This option is available on the context menu of the application library. For more details, refer to the Document Manager section.

REENGINEER PROGRAMS

The **Reengineer Programs** option submits a batch job which performs the two tasks – Reengineering and Service Modules generation. The batch command (**XREGENS**) reengineers the client programs in such a way that the old code in RPG/RPGLE free/fixed format gets converted into free format procedure-based module. It does not change the program structure. The subroutines are converted into procedures.

The **Reengineer Programs** option is available on the context menu of application library and application areas and also available on individual ***PGM** type objects, under the **Modernization Options** submenu. Select this option to display the following dialog:

Reengineer Programs dialog					
🚔 Reengineer Programs 🛛 🔀					
X-Ref Library Application Area	XAN4CDXA *ALL				
OK	Cancel				

Click **OK** to submit a batch job.

The following window displays the progress of the batch job.

Datch Job Flogress view	
👫 Thumbnail View 🔂 Business Rules 🖾 Progress 🛛	💥 v 🗆 🗖
XREENGINER/SKHAN/668452	
ACTIVE	

At any point, while the batch job is running, click the hyperlink (***ACTIVE**) to view the Job Log. The Job Log view is shown below:

Batch Job Progress view



	Job Log view	
٢	Reengineer Programs - Log	
Reengi	neer Programs	
Comm	nand: XREENGINER PROGRAM(*ALL) XALIB(XAN4CDXA)	
Library	/ List: XAN4CDXA XAOBJ QGPL QTEMP	
Job Log]	
01/12	n Dec 01 17:46:57 IST 2014: Job 668452/SKHAN/XREENGINER started on 2/14 at 12:17:48 in subsystem QBASE in QSYS. Job entered system on 01/12/14 17:48.	^
- Mo	n Dec 01 17:46:57 IST 2014: Job 668452/SKHAN/XREENGINER submitted. n Dec 01 17:46:57 IST 2014: XREENGINER PROGRAM(*ALL) XALIB(XAN4CDXA)	
- Mo	n Dec 01 17:46:57 IST 2014: Library XAN4CDXA already exists in library list. n Dec 01 17:46:57 IST 2014: Member XAALIBL file XAALIBL in DBUK opened. n Dec 01 17:46:57 IST 2014: Open options ignored for shared open of member	~
	OK	

The 'Task Completed' message is displayed once the process is complete.

Now, double-click on the **Screen Components** node available under the cross-reference node in the navigation pane. It displays the Screen Components for the application. This option is also available for application areas.

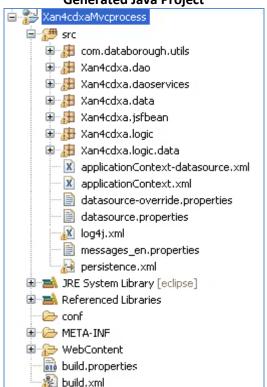
🚼 Screen Components 🛛 💦 🧏 🧏 🧏 🥵 🔣 🕶 🖫 🛗 🖨 🗩 😁 🗖							
Screen Components for Application Library XAN4CDXA (All)							
Function	Туре	Seq No	DSPF Format	Physical File	Title	1	
	G					-	
CBCONDETNW01G	G	1	ZZSF01	STKMAS	Work with Order Detail		
CBCONDETNW02D	R	3	ZZFT01	STKMAS	Work with Order Details		
CBCONDETNW03D	C	4	ZZFT02	CONHDR	Work with Order Details		
CBCONDETNW01D	R	5	ZZCT01	CONHDR	Work with Order Detail		
CBCONDETNW04D	C	5	ZZCNF1	STKMAS	Work with Order Details		
CBCONDETNW0	Т	7	ZZCT01		Work with Order Detail		
CBCUSFMNT01D	R	5	ZZFT01		Customer Site Maintena		
	В					1	
	r Application Library 3 Function CBCONDETNW01G CBCONDETNW02D CBCONDETNW03D CBCONDETNW01D CBCONDETNW04D CBCONDETNW0	Function Library XAN4CD Function Type CBCONDETNW01G G CBCONDETNW02D R CBCONDETNW03D C CBCONDETNW04D R CBCONDETNW04D C CBCONDETNW04D C CBCONDETNW04D C CBCONDETNW04D T CBCONDETNW04D R CBCUSFMNT01D R	Colspan="2">Colspan="2"Colspan="2">Colspan="2"C	Geq No DSPF Format Function Type Seq No DSPF Format CBCONDETNW01G G 1 ZZSF01 CBCONDETNW02D R 3 ZZFT01 CBCONDETNW03D C 4 ZZF02 CBCONDETNW04D R 5 ZZCT01 CBCONDETNW04D C 5 ZZCT01 CBCONDETNW04D C 5 ZZCT01 CBCONDETNW04D T 7 ZZCT01 CBCONDETNW04D R S ZZCT01 CBCONDETNW04D R S ZZCT01 CBCUSFMINT01D R S ZZFT01	Application Library XAN4CUXAII Function Type Seq No DSPF Format Physical File G G ZZSF01 STKMAS CBCONDETNW01G G 1 ZZSF01 STKMAS CBCONDETNW02D R 3 ZZF101 STKMAS CBCONDETNW03D C 4 ZZF102 CONHDR CBCONDETNW04D R 5 ZCT01 CONHDR CBCONDETNW04D C S ZZCNF1 STKMAS CBCONDETNW04D C S ZZCNF1 STKMAS CBCONDETNW04D C S ZZCNF1 STKMAS CBCONDETNW04D R S ZZCT01 CONHDR CBCONDETNW04D R S ZZCT01 CONHDR CBCUSFMINT01D R S ZZF101 Image: State S	Function Type Seq No DSPF Format Physical File Title G G Image: CBCONDETNW01G G 1 ZZSF01 STKMAS Work with Order Detail CBCONDETNW02D R 3 ZZFT01 STKMAS Work with Order Details CBCONDETNW03D C 4 ZZFT02 CONHDR Work with Order Details CBCONDETNW04D R 5 ZZCT01 CONHDR Work with Order Details CBCONDETNW04D R 5 ZZCT01 CONHDR Work with Order Details CBCONDETNW04D R 5 ZZCT01 Mass Work with Order Details CBCONDETNW04D R 5 ZZCT01 CMHAS Work with Order Details CBCONDETNW04D R 5 ZZCT01 CMHAS Work with Order Details CBCUSFMINT01D R 5 ZZFT01 Customer Site Maintena	

GENERATE PROGRAMS

Select the **Generate Programs** option to generate a new Java application using the recovered screens and business logic.

Generate Programs dialog					
😂 Generate Program(s) 🗙					
Project					
Name Xan4cdxa					
Project Components					
- DAO, Entities					
- UI – JSF, beans, CSS					
- Business Logic					
OK Cancel					

The option generates a new Java application by default. The generated application follows MVC (Model-View-Controller) Architecture and uses Open frameworks viz., Spring, Hibernate, JSF 2.0 (Facelets), JQuery, etc. which drive it. The generated project has its neatly organized classes under various packages. See the screenshot below:



Generated Java Project

You can also generate the Silverlight/C# project. Here, the recovered screens are generated using Silverlight and the code behind/business logic is in C#.

INTER-REPOSITORY OPTIONS

X-Analysis provides an option to compare database files across two cross-reference libraries. The options available are as under:

- Generate Difference Analysis
- Generate PTF Analysis
- Display Difference Analysis
- PTF Analysis
- Customized Libraries
- Manage Linked Repositories

For detailed description, refer to the Inter-Repository Options section.

AUDIT OPTIONS

X-Analysis provides the following Audit Options:

- Metrics Analysis
- Screen Metrics
- File Metrics
- Business Process Logic Metrics
- Specialized Analysis
- Problem Analysis
- Object Allocation
- Database Summary
- Summary Report
- Initialize Source Archiving
- Generate Metrics Analysis
- Edit Problem Audit Limit

- Edit Problem Categories
- Generate Problem Analysis
- View Database Size Statistics

For detailed description, refer to the Audit Options section.

WORK WITH MULTIPLE LIST OPTIONS

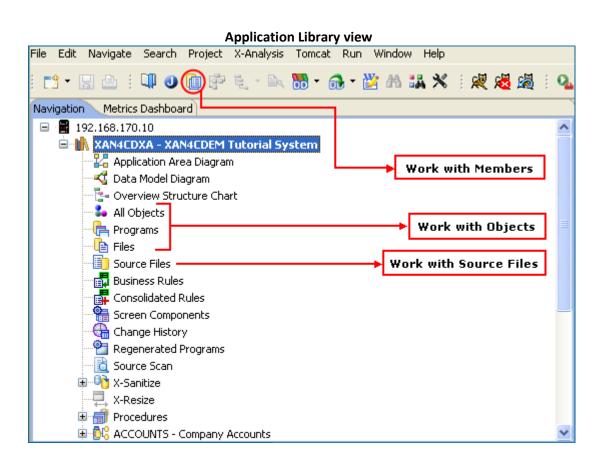
X-Analysis facilitates you to work flexibly and methodically by generating multiple lists. Under an application library, double-click on these nodes – **Files**, **Programs** or **All Objects** – to display the **Work with Objects** dialog. Alternatively, click **Member List** from the toolbar to bring up the **Work with Members** dialog. Likewise, you can access additional lists by double-clicking on the **Source Files** node to view the source list comprising source files.

Double-click on an individual Source File to view its Member List.

The various lists that can be generated are as under:

Lists	Brief Description		
Object List	Displays a list of all/specified objects.		
Member List	Displays a list of all /specified source members.		
Source Files	Displays a list of all source files.		
Business Rules	Displays a list of all business rules and their narrations.		
Consolidated Rules	Displays a list of all rules based on file-field combination.		
Screen Components	Displays a list of all reengineered components.		
Change History	Displays a list of all source members that are modified.		
Procedures	Displays a list of all procedures.		
X-Analysis Bookmarks	Displays a list of objects that are bookmarked.		





OBJECT LIST

The Object List displays a list of all objects of the specified type from the selected library. Double-click on the **All Objects** node under the cross-reference library (**XAN4CDXA**) to bring up the **Work with Objects** dialog.



	rea				
Name		Description			
*NONE	~	All Membe	rs Select	ed	
Object					
		Library			
		*ALLUSR	*		
Name		Туре		Attribute	
*ALL		*ALL	~	*ALL	•
Text					
Function Attr		Function Typ	e	PF Name	

The Library drop-down box contains the following two important entries, apart from the user libraries:

- ***ALLUSR** All objects belonging to the user libraries
- ***ALL** All objects (including those in the X-Ref lib)

The default option is ***ALLUSR**.

Programs

When you double-click on the **Programs** node, the same **Work with Objects** dialog is invoked, but with the Type/Attribute set as ***PGM/*ALL**. Click **OK** to get the Object List for ***Programs**.

				Sjeet List Trograms					
🌢 Programs 🔀									
Object List of *	allusr/*all	/*PGM/	*ALL/*ALL	/*ALL, Total Objects: 153	🐝 • 🖨	X •		æ	3
Library	Name	Туре	Attribute	Description	Status	Changed	Created	Used	
CLXAN4CDEM	CBC110	*PGM	CLP	Order Entry System	*А	19/03/13	01/09/08	20/06/13	Į
R ^e xan4CDEM	CB906R	*PGM	RPG	Back-out account	*в	19/03/13	03/12/12	20/06/13	J
CLXAN4CDEM	CLET	*PGM	CLP	Build Customer Letter	*А	19/03/13	01/09/08	20/06/13	J
CLXAN4CDEM	CLETN	*PGM	CLP	Print Customer Letter	*А	19/03/13	01/09/08	20/06/13	J
REXAN4CDEM	CNTCMAINT	*PGM	RPGLE	Contacts Maintenance	*А	19/03/13	13/09/10	20/06/13	
REXAN4CDEM	CONUPDO	*PGM	RPGLE	Revert Back Customer Info	*D	11/06/13	04/06/13	20/06/13	
RE XAN4CDEM	CONUPD1	*PGM	RPGLE	Update Customer Info - Version 1	*D	11/06/13	04/06/13	20/06/13	
RE XAN4CDEM	CONUPD2	*PGM	RPGLE	Update Customer Info - Version 2	*D	11/06/13	05/06/13	20/06/13	
R ⁶ XAN4CDEM	CON001	*PGM	RPG	Contract Entry	*D	19/03/13	01/09/08	20/06/13	
CL XAN4CDEM	CPDM	*PGM	CLP	List Correspondence	*А	19/03/13	01/09/08	20/06/13	
CL XAN4CDEM	CSEC	*PGM	CLP	Build Security Fax	*А	19/03/13	01/09/08	20/06/13	
CL XAN4CDEM	CSEC2	*PGM	CLP	Add Code to Batch	*в	19/03/13	01/09/08	20/06/13	
CLXAN4CDEM	CSEC3	*PGM	CLP	Agent Fax Prompt	*А	19/03/13	01/09/08	20/06/13	;
R ⁶ XAN4CDEM	CUSCPY	*PGM	RPG	Customer Copy	*D	19/03/13	01/09/08	20/06/13	
<								>	

Object List – Programs

The columns that appear in the Programs List are as follows:

Library: displays the name of the Object Library

Name: displays the name of the program

Type: displays the type of object; in this case it is *PGM

Attribute: displays the object attribute like RPG/LE or CLP or CBL

Description: displays textual description/long name of the program

Status: displays the program status which will be either *A, *B, *C or *D. The details are provided in the Component Status section on the following page.

Changed: displays the date when the program was changed

Created: displays the date the program was created

Used: displays the date when the program was last used

Function: displays the function of the object. The various types are explained under the Function Type section.

PF Name: displays the name of the physical file related to the program

BR Count: displays the total count of business rules related to the program

Annot. Count: displays the total count of business rule annotations related to the program

Stmt. Count: displays the total count of the statements in the source list of the program

LEGACY

Screen Count: displays the total count of screens recovered by the re-engineering process

Mode Count: displays the total count of modes available to access the screens belonging to a program.

Double-click on the list item opens the object's source code in the source browser.

Files

Similarly, double-click the **Files** node under **XAN4CDXA** to bring up the **Work with Objects** dialog with the Type/Attribute set to ***FILE/PF**. Double-clicking on the **All Objects** node resets the Type/Attribute to ***ALL/*ALL**.

The following screen displays the Object List for Files:

			, - , - ,	te Else Thes				
🕹 Files 🛛								
Dbject List of *ALLUSR/*ALL/*FILE/PF/*ALL/*ALL, Total Objects: 50								
🐝 = 🖨 🗵 =								
Library	Name	Туре	Attribute	Description	Status	Changed	Created	^
PF XAN4CDEM	ASIMPLTEST	*FILE	PF		*D	05/06/12	30/03/11	
PF XAN4CDEM	ASTATUS	*FILE	PF	Status file	*A	05/06/12	01/09/08	
PF XAN4CDEM	CNTACS	*FILE	PF	Contacts	*C	05/06/12	01/09/08	-
PFXAN4CDEM	CONDET	*FILE	PF	Contract Detail	*в	15/08/12	01/09/08	
PF XAN4CDEM	CONDETNW	*FILE	PF	Contract Detail new -?	*D	05/06/12	02/02/11	
PF XAN4CDEM	CONHDR	*FILE	PF	Contract Header	*в	25/09/12	01/09/08	
PFXAN4CDEM	CPYBKSRC	*FILE	PF	Cobol copybooks	*D	05/06/12	10/05/11	
PFXAN4CDEM	CUSF	*FILE	PF	Sites	*в	22/06/12	01/09/08	
PF XAN4CDEM	CUSGRP	*FILE	PF	Customer Groups	*A	05/06/12	01/09/08	
PF XAN4CDEM	CUSTS	*FILE	PF	Purchases	*в	04/10/12	01/09/08	
PF XAN4CDEM	DELIVA	*FILE	PF	Delivery Areas	*в	05/06/12	01/09/08	
PF XAN4CDEM	DISTS	*FILE	PF	Distributors	*А	05/06/12	01/09/08	×
<							>	

Object List – Files

The description of the columns that appear in the Files List are as follows:

Library: displays the name of the Object Library

Name: displays the name of the file

Type: displays the type of object; in this case it is *FILE

Attribute: displays the object attribute like PF, LF, DSPF or PRTF

Description: displays textual description/long name of the file

Status: displays the file status which will be either *A, *B, *C or *D. The details are provided in the Component Status section on the following page.

X-Analysis User Manual 11.1

Changed: displays the date when the file was changed

Created: displays the date the file was created

Used: displays the date when the file was last used.

Stmt. Count: displays the total count of the statements in the source list of the file

Format Count: displays the total count of screen formats related to a file.

The displayed Object List is sorted on an object's name in ascending order. Click the respective column heading to change the sort order.

To narrow down the search, the object name on the object group may be mentioned as well. It can be:

*ALL

Object Name (maximum 10 characters long).

Besides the other settings, the following can also be specified on the dialog:

Component Status

The Component Status can be picked up by selecting appropriate status, for e.g. *A,*B, etc. under the **Function Attributes** section.

Work with Object	s dialog show	ing Co	omponent Status
 Function Attributes 			
Component Status	Function Type		PF Name
*ALL	*ALL	*	*ALL
トス Program Type			
All	~		

Component Status for Programs

- *A Parent or top-level program i.e. calls other programs but is not called itself
- *B Program is called by another and also calls other programs
- *C Program at the end of a program tree; does not call other programs
- *D Standalone program

LEGACY

Component Status for Files

- *A Accessed by other files, but does not access any other file
- *B Accesses other files and gets accessed by other files
- *C Only accesses other files, not accessed by others
- *D Standalone file

Function Type

This describes the function of the object and based on COOL: 2E definitions.

work with Obje	cts dialog display	ying runction type
Function Attributes		
Component Status	Function Type	PF Name
*ALL 🔽	*ALL	*ALL
Program Type	*ALL DSPDEV DSPFIL DSPOTH	- S
	DSPRCD	×

Would with Objects dieles displaying Exaction Type

The Function Attributes apply to program type objects only. The available Function Types are defined here:

*ALL – Displays all objects; no function filter is applied.

DSPDEV – Defines a program which includes the Display file/s.

DSPFIL (Display File) – Defines a program which displays the records from a specified file, many at a time, using a sub-file.

DSPOTH (Display Other) – Defines a program which displays records from Display File(s) and does not have any file(s) in update/write/read mode. Also the program does not have any Printer File(s).

DSPRCD (Display Record) – Defines a program which displays a single record from a specified database file.

DSPRCD2 (Display Record 2 panels) – Defines a program that is identical to the DSPRCD function, except that it allows the database record details to extend to two separate display device pages.

DSPRCD3 (Display Record 3 panels) – Defines a program that is identical to the DSPRCD function, except that it allows the database record details to extend to three separate display device pages.

DSPTRN (Display Transaction) – Defines a program which displays the records from a specified pair of database files. The pair must be connected by an **Owned by** or **Refers to** relation.

EDTFIL (Edit File) – Defines a program which maintains records on a specified file, many at a time, using a sub-file.

EDTRCD (Edit Record) – Defines a program which maintains (add, change, and delete) records on a specified file, one at a time.

EDTTRN (Edit Transaction) – Defines a program which maintains the records on a specified pair of header and detail files. The pair must be connected by an **Owned by** or **Refers to** relation.

EDTRCD2 (Edit Record 2 panels) – Is identical to the Edit Record function, except that it allows the record details to extend to two separate display pages.

EDTRCD3 (Edit Record 3 panels) – Is identical to the Edit Record function, except that it allows the record details to extend to three separate display pages.

EXCUSRPGM (Execute User Program) – Defines a program which allows a user to describe the interface to a user-written HLL program so that it can be referenced by functions.

OTH (Other) – Defines a program which calls a program and does not have any files in update/write/read mode. Also the program does not have any Display File(s) or Printer File(s).

OTHCAL (Other Call) – It is identical to the OTH function except that it allows call with parameters.

OTHFIL (Other File) – Defines a program which accepts files in input mode and does not have Printer File(s), Display File(s) or any other files in update/write mode.

PMTRCD (Prompt Record) – Defines a program which prompts for a list of fields defined by a specified access path. The validated values can be passed to any other function.

PRTDSP (Print Display) – Defines a program which Display/Print records from input files and does not have any files in update/write mode.

PRTFIL (Print File) – Defines a program which prints records from a specified access path.

SELRCD (Select Record) – Defines a program which displays the records from a specified file, many at a time, using a sub-file. The program allows you to select one of the records. The selected record is returned to the calling program. This function is called from a function that requested a selection list.

UPDFIL (Update File) – Defines a program which updates specified files and does not have any Printer File(s) or Display File(s).

UPDOTH (Update Other) – Defines a program which updates data areas and has Display File(s). The program neither has a Printer File(s) nor files in update/write/read mode.

UPDPRT (Update Print) – Defines a program which prints a report with update(s) from the specified printer files. It does not have display files.

MEMBER LIST

LEGACY

The **Member List** option displays the list of source members for a specified source file of the selected library. The Member List contains the members available in the selected library and the source file, based on the selected criteria.

Click the **Member List** icon, the following dialog is invoked:

Work with Members dialog					
🖨 Work with Members					
Application Area Application Area *NONE	Description All Members Selected				
Library/Source File Name Library *ALLUSR	Source File *ALL				
Member Details Member *ALL Text	Type *ALL				
	Cancel				

Specify the selection criteria on the dialog to display a set of members.

- 1. Select the Source File and the Library using the drop-down list. Selecting ***ALLUSR** as the library name prevents the source files in the cross-reference library from getting displayed.
- 2. The Member name on the Member Details group can be:
 - o *ALL
 - Member Name (maximum 10 characters long)

- 3. Select the Type from the drop-down list.
- 4. Click OK.

The following screen displays the list of members for the selected criteria. Select any member and double-click to invoke its Source List.

Member List						
📋 Member List 🛛 🖓 🗖						
Member List of	*ALLUSR/*#	ALL/*ALL/*ALL,	Total Me	mbers: 325 🛛 🖨 🗵 🔻	AA -	
Library	Source File	Name	Туре	Description	Date Changed 🛛 🔼	
PFXAN4CDEM	QDDSSRC	ASTATUS	PF	Status file	25/05/11	
C ^B XAN4CDEM	QCBLSRC	CBCONDET	CBL	Work with Order Details	13/09/11	
C ^B XAN4CDEM	QCBLSRC	CBCONDETNW	CBL	Work with Order Details -?Long fi	13/09/11	
C ^B XAN4CDEM	QCBLSRC	CBCONHDR	CBL	Work with Orders - Cobol vers.	13/09/11	
C ^B XAN4CDEM	QCBLSRC	CBCUSFMNT	CBL	Customer Site Maintenance	13/09/11	
C ^B XAN4CDEM	QCBLSRC	CBCUSTMNT2	CBL	Customer Detail Maintenance -?L	13/09/11 🛛 🗸	

The first screen is sorted on the member name in ascending order. To change the sort order or to sort on any other column, click the respective column heading.

SOURCE FILES

Double-click on the **Source Files** node to generate a list of all the source files. The option is available under the cross-reference node. Double-click on any source file to display the Member List.

	Sourc	e File List	
🔚 All Procedures List	Exportable Functions List	🚺 Source Files 🛛	
Source File List for: XA	N4CDXA, Total Objects: 13		a 🛛 🔹
Source Library	Source File	Source File Text	
XAN4CDEM	ASIMPLTEST		
XAN4CDEM	CPYBKSRC	Cobol copybooks	
XAN4CDEM	QCBLSRC	CBL Source File	
XAN4CDEM	QCLSRC		
XAN4CDEM	QCMDSRC		
XAN4CDEM	QDDSSRC		
XAN4CDEM	QLETSRC		
XAN4CDEM	QQMQRYSRC		
XAN4CDEM	QRPGLESRC	RPGLE Source File	
XAN4CDEM	QRPGSRC		
XAN4CDEM	QSECTXT		
XAN4CDXA	QDDSSRC	DDS Source File	
XAN4CDXA	QRPGLESRC	Generated RPG Service Modules	



BUSINESS RULES

The program source is grouped into discrete blocks of logic so that each block represents a particular execution of business logic. This block of code is then converted into pseudo code that describes the execution of the logic. Literals and constants are liberally used in the narration, wherever possible, giving accurate descriptions of the logic. These logics are termed as Business Rules.

The **Business Rules** option displays a list of all the business rules and their narrations for the selected cross-reference library. The **Business Rules** node is available under the cross-reference node.

🛃 Business Rules	X			📃 🕶 🏹 🌾 🍸 🖨 🗵 🕶 🛄 🖛 🗮 🖓 🕻
Business Rules for	*ALL, Number o	f Lines: 412		
Source Member	Rule Number	Field	File	Rule
CB906R	00001	SSRLNB	SECF	Srl_no = blank
CB906R	00002	SSRLNB	SECF	Srl_no = blank
CB906R	00003	SSRLNB	SECF	Srl_no = blank
CNTCMAINT	00001	CUSNO	CNTA	Cus_No not found on Contacts
CNTCMAINT	00002	IXNAME	NAME	Name found on Names_Index
CNTCMAINT	00003	USERNM	CNTA	Contact = blank
CNTCMAINT	00004	TELNO	CNTA	Phone <> blank
CNTCMAINT	00005	FAXNO	CNTA	Fax_No <> blank
CNTCMAINT	00006	SINIT	CNTA	Sales_Person <> blank
CNTCMAINT	00007	SINIT	CNTA	Exact match not found for Sales_Person on Contacts
<				>

Business	Rules	for	XAN4CDXA
-----------------	-------	-----	----------

CONSOLIDATED RULES

X-Analysis provides an important feature related to file-fields and business rules. Through this feature you can view all the business rules related to a file-field. Double-click the **Consolidated Rules** node to invoke the following window:



Consolidated	Rules for	XAN4CDXA
--------------	------------------	----------

onsolidated R	ules for XAN4CDXA - Full View; Field Count: 60 Rule Count: 178	🖉 📈 🖃 🗷 🖷 🖨	II •	孡
	File/Field/Rule	Member	Message ID/Description	
4	CNTACS (Contacts)			
4	CUSNO (Cus. No.)			
\triangleright	Cus_No = 0	WWCCONS/2/247		
\triangleright	Cus_No found on Contacts	WWCCONS/1/160		
\triangleright	Cus_No not found on Contacts	CNTCMAINT/1/44		
4	FAXNO (Fax.No.)			
\triangleright	Fax_No <> blank	CNTCMAINT/5/184	OEM0015 (The fax. no. is in	valid
4	SINIT (Sales Person)			
\triangleright	Exact match not found for Sales_Person on Contacts	CNTCMAINT/7/198	OEM0023 (Invalid salesman	.)
\triangleright	Sales_Person <> blank	CNTCMAINT/6/196		
4	STATUS (Sts)			
⊳	Sts <> blank	CNTCMAINT/8/209	OEM0019 (The status is invi	alid.)
				>

Select any business rule listed under a file and expand the business rules node to check the actual business rules code used, as shown below:

	Expand Dusines	s Rules node to see the a		
📮 Consolid	dated Rules 🛛			
Consolidate	ed Rules for XAN4CDXAField Count	: 60 Rule Count: 178 🖉 🏹 📄 🗵	• 🖨 🚺 •	舑
	File/Field/Rule	Rule	Member	Message ID/Desc
4	CNTACS (Contacts)	CNTACS (Contacts)		
4	CUSNO (Cus. No.)	CUSNO (Cus. No.)		
\triangleright	Cus_No = 0	Cus_No = 0	WWCCONS/2/247	
\triangleright	Cus_No found on Contacts	Cus_No found on Contacts	WWCCONS/1/160	
⊿	Cus_No not found on Contacts	Cus_No not found on Contacts	CNTCMAINT/1/44	
	// ?Retrieve record	// ?Retrieve record		
	READ rentae entacskey	READ rentae entacskey		
	IF not %found(cntacs)	IF not %found(cntacs)		
	*inIr EQ *on	*inIr EQ *on		
	RETURN	RETURN		
	END	END		
< .				>

Expand Business Rules node to see the actual code

SCREEN COMPONENTS

The reengineering process involves several steps that generate various reengineered components for each program. There are eight types of reengineered components, details of which are accessible through the **Screen Components** option. Double-click on the **Screen Components** node to invoke the **Work with Screen Components** dialog, as shown below:



Screen Components dialog

🖨 Work with	Screen Components	×
Application Are	за	
Name	*NONE	
Description	All Members Selected	
Developme	ent Screens	
	OK Cancel	

Click **OK** to generate the list of all Screen Components.

		Scre	en Con	nponents Lis	st		
🔠 Screen Componer	its 🖾			B 🛦 🖪 🕫 I	ê 🔍 😨 🔹	i 🗸 👸 🖨 🛛 • 🗋	
5creen Components fo	or Application Library	XAN4CD	XA (All)				
Program	Function	Туре	Seq No	DSPF Format	Physical File	Title	^
CB906R		I					
	CB906R01D	R	1	CB906R1		Date	
	CB906R02D	C	2	SHD001		ACCOUNT ENTRY	
÷	CB906R03D	R	3	SCT100		ACCOUNT ENTRY	
÷	CB906R04D	R	5	SCT101		ACCOUNT ENTRY	
÷	CB906R05D	R	7	SCT102		ACCOUNT ENTRY	
	CB906R06D	R	9	XFLAT1	SECF	ACCOUNT ENTRY	
CNTCMAINT		I					
	CNTCMAINT01D	R	1	ZZFT01	CNTACS	Contacts Maintenance	4
CON001		I					
	CON00101D	R	99	OESFLC	CONHDR	CONTRACT ENTRY	~
<							

The following table displays the details of the generated reengineered components:

Component	Туре	Description
TSAJE1R	*PGM	Executable reengineered program
TSAJE1RB	*SRVPGM	Created using TSAJE1RA and TSAJE1RB modules
TSAJE1R	*MODULE	UI module for the Reengineered program
TSAJE1RA	*MODULE	Re-engineered Action Diagram aka Programmed Module
TSAJE1RB	*MODULE	Re-engineered Controller aka Generated Code Module
TSAJE1RB	*FILE	Program Variables structure aka Program Data Object
TSAJE1RD	*FILE	Display file used by the reengineered program
TSAJE1RG	*FILE	Grid Data Object

To display the 'Screen Components' list for a specific program, opt for the context menu on that program and select the **Screen Components** option.

Development Screens

A Development Screen is a set of data that describes how information is to be displayed on a screen and governs the user interactivity with that information. For instance, validation information may be held for a field or details of a program to be called when the record is updated. In short, a Development Screen is a set of metadata relating to a screen display.

Select Screen Components and double-click on it to display the Work with Screen Components dialog. Then, check the Development Screens box which expands the dialog for the Development Screens option as shown below:

🖨 Work with	Screen Co	omponents	×
Application Are	a		
Name	*NONE	~	
Description	All Members	Selected	
	nt Screens		
File Name		*ALL	
Function Typ	ре	*ALL 🔽	
Show So	creen Compo	nents also	
	ОК	Cancel	

Work with Development Screens dialog

Click **OK** to generate a list of all Development Screens for the cross-reference library.

201010	•	
15 🔀	🎪 🔍 46 🛋 🖏 🖨 🗩 🗸 🖓	
t of *NONE/*ALL/*ALL		
Physical File	Title	^
ASTATUS	Status file	-
CNTACS	Contacts	
CONDET	Contract Detail	
CONDETNW	Contract Detail new -?CBL Ver, with Long fields	
CONHDR	Contract Header	
CUSF	Sites	
CUSGRP	Customer Groups	
CUSTS	Purchases	
DELIVA	Delivery Areas	
DISTS	Distributors	¥
	t of *NONE/*ALL/*ALL Physical File CNTACS CONDET CONDETNW CONHDR CUSF CUSF CUSGRP CUSTS DELIVA	t of *NONE/*ALL/*ALL Physical File Title ASTATUS Status file CNTACS Contacts CONDET Contract Detail CONDETNW Contract Detail new -?CBL Ver. with Long fields CONHDR Contract Header CUSF Sites CUSTS Purchases DELIVA Delivery Areas

Development Screens List

The columns of Development Screens List are described below:

- Function: This column lists the Standard Development Screen Definitions associated with the Development Screen in X-Analysis. These Standard Development Screen Definitions are built when the data model is created, directly from the database of the existing application, using the data model relationships to control cross-file validation and navigation.
- Physical File: This column represents the associated Physical File name with the specific Standard Development Screen in the database. Standard Development Screens tie directly to physical files, and can be used for file maintenance and display, as well as providing searchable grids and general purpose reports.
- **Title:** This represents the description of the Development Screen as per the database.

CHANGE HISTORY

The Change History option lists the source members that have a change in their history.

Double-click the **Change History** node under **XAN4CDXA** to invoke the following **Work** with **Change History** dialog:

🖨 Work with	Change History	×
Object Name	*ALL]
From Date	YYYY-MM-DD]
To Date	YYYY-MM-DD]
	K Cancel	

Change History dialog for XAN4CDXA

Click **OK** to invoke the following window.



	Change H	istory win	dow for XAN	4CDXA	
• Object List 🛛 🔀 🕻	hange History 🛛				
hange History for XAN	4CDXA		6	🤉 - 🔂	#
ChangedDate/Name	Library	Туре	Attribute	Description	2
CUSGRSELR	XAN4CDXA	*PGM	RPGLE	Customer group Selection	
CUSGRSELR	XAN4CDXA	*PGM	RPGLE	Customer group Selection	-
CUSFSELR	XAN4CDXA	*PGM	RPGLE	Customer Site Selection	
CUSFSELR	XAN4CDXA	*PGM	RPGLE	Customer Site Selection	
⊒ 2013-03-14					
XRATE_EURO	XAN4CDEM	*PGM	RPG	Euro Conversion Calculation	
WKSECF6	XAN4CDEM	*PGM	RPG	Generate CPU Letter	
WKCUS8P	XAN4CDEM	*PGM	RPG	Customer Enquiry Letter	
WKCUS8EF	XAN4CDEM	*PGM	RPG	Find Fax Number	
WKCUS8E	XAN4CDEM	*PGM	RPG	Customer Release Letter	
WKCUSP	XAN4CDEM	*PGM	RPG	Summary Customer Report	
SEC1	XAN4CDEM	*PGM	RPG	Security Code Report	1

Change History window for XAN4CDXA

Select a row and right-click on it for the context menu to call up a suitable source compare window. The following screen displays the context menu against a selected row:

Context Menu displaying Source Compare Options								
🎝 Object List 👘 🚮 Cha	nge History 🛛							
Change History for XAN4	EDXA		6	2 - ₽	<i>i</i> #1 -			
ChangedDate/Name	Library	Туре	Attribute	Description	^			
CUSGRSELR	XAN4CDXA	*PGM	RPGLE	Customer group Selection				
CUSGRSELR	XAN4CDXA	*PGM	RPGLE	Customer group Selection	_			
CUSFSELR	XAN4CDXA	*PGM	RPGLE	Customer Site Selection				
CUSFSELR	XAN4CDXA	*PGM	RPGLE	Customer Site Selection				
⊒ 2013-03-14								
XRATE_EURO	XAN4CDEM	*PGM	RPG	Euro Conversion Calculation				
WKSECF6	XAN4CDEM	📘 Compare wit	h Previous	Generate CPU Letter				
WKCUS8P	XAN4CDEM	📘 Compare wit	:h Next	Customer Enquiry Letter				
WKCUS8EF	XAN4CDEM	🛯 Compare wit	h Current	Find Fax Number				
WKCUS8E	XAN4CDEM	≁PGM	RPG	Customer Release Letter				
WKCUSP	XAN4CDEM	*PGM	RPG	Summary Customer Report				
SEC1	XAN4CDEM	*PGM	RPG	Security Code Report	~			

Context Menu displaying Source Compare Options

You can also view this data in program sequence. For this, click on the **Order by Program** option available on the toolbar.

Order by Program option							
🕹 Object List 🛛 👫	Change History	× X					
Change History for X	(AN4CDXA			a 🛛 -	•	待 -	
ChangedDate/Name	Library	Туре	Attribute	Description	Source change	edate 🔼	
📃 2013-03-20					Order by Program		

The following window will be invoked:

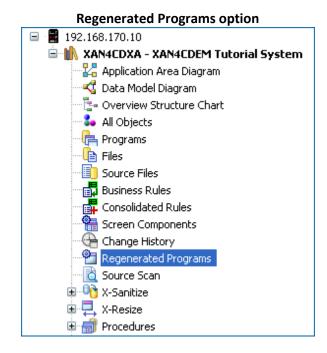


	Change Hist	ory – Orde	er by Progran	n window	
🎝 Object List 🛛 📊 🖓	nange History 🛛				
Change History for XAN	4CDXA		8	⊿ - 🔂	# •
ChangedDate/Name	Library	Туре	Attribute	Description	^
📃 CB906R					_
2013-03-14	XAN4CDEM	*PGM	RPG	Back-out account	
E CBC110					
2013-03-14	XAN4CDEM	*PGM	CLP	Order Entry System	
2011-09-13	XAN4CDEM	*PGM	CLP	Order Entry System	
🖃 CLET					
2013-03-14	XAN4CDEM	*PGM	CLP	Build Customer Letter	
2011-09-21	XAN4CDEM	*PGM	CLP	Build Customer Letter	
CLETN					
2013-03-14	XAN4CDEM	*PGM	CLP	Print Customer Letter	
CNTCMAINT					
2013-03-14	XAN4CDEM	*PGM	RPGLE	Contacts Maintenance	~

~ 112-4

REGENERATED PROGRAMS

You can view the list of programs regenerated through the Regenerated Programs node. The node is available on the navigation pane of the tutorial application, as shown below:



Double-click the node to invoke the following window:



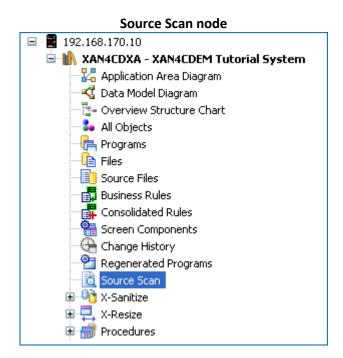
Regenerated Programs window

🕙 Regenerated Programs 🖾 👘 🗖							
Regenerated Programs list for XAN4CDXA, Total Objects: 29 📴 👖 🛪 🖨 🗵 🔻 👫							
Legacy Program	Reengineered Member Name	Physical File	Access Path				
MTT1	MTT1	CUSTS					
MTT2	MTT2	CUSTS					
CUSFSEL	CUSFSELR						
CUSFSEL	CUSFSELR						
CUSGRSEL	CUSGRSELR						
CUSGRSEL	CUSGRSELR						
CUSTMNT1	CUSTMNT1R						
CUSTSSEL	CUSTSSELR						
CUSTSSEL	CUSTSSELR						
DISTSSEL	DISTSSELR						
DISTSSEL	DISTSSELR						
ORDSTSEL	ORDSTSELR			~			

SOURCE SCAN

The **Source Scan** node helps you scan particular text (also comments) used in a prescribed source member, or in general, all across the application/application area.

The node is available on the navigation pane, as shown below:



Double-click the node to invoke the Work with Members – Source Scan dialog.



Source Sca	an dialog
🖶 Work with Members	- Source Scan 💦 🔀
Member Details Application Area	Library
*NONE	*ALLUSR 🔽
Source File	Туре
*ALL 🔽	*ALL 🔽
Search Details Search Text	
ОК (Cancel

You can provide keywords in the 'Search Text' box. If an application area is not selected, then click **OK** to scan the entire application for the Object(s) with the keywords specified by you. Limit the scan by selecting appropriate details in the other drop-down boxes. In this way you will get results quickly. The words mentioned in the 'Search Text' box will also scan the source member(s) for comments (if any) containing the keywords.

Select the required Member Details and fill in the keyword/s, as is shown below.

🖨 Work with Me	mbers	- Source Scan	×
Member Details Application Area		Library	
XTEST	*	XAN4CDEM	*
Source File		Туре	
*ALL	~	CLP	~
Search Details			
Search Text	Test		
ОК		Cancel	

Source Scan dialog – with details

When the scan is complete, the Source Scan result is displayed as follows:

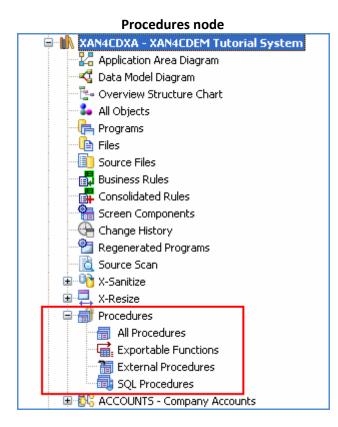


Window displaying Source Scan result

🗒 Business Rule	s 🛃 Source	Scan Result 🛛 🖨 🛽	3 • 🚺 • 🗆 🗖
Source Scan for T			
Name	Seq No	*+ 1+ 2+ 3+ 4	+ 5
XASYSOPR	2.00	SNDMSG MSG('XA Test Alert') TOUSR(*S)	(SOPR)
ORDAUDIT01	14.00	USRDTA (BATCHTEST) SPLFNAME (ORDERS)	
ORDAUDITO1	19.00	USRDTA (BATCHTEST) SPLFNAME (BALANCESTO)	
ORDAUDITO1	24.00	USRDTA (BATCHTEST) SPLFNAME (BALANCEPRD)	
ORDAUDIT02	14.00	USRDTA (BATCHTEST) SPLFNAME (ORDERS)	
ORDAUDIT02	19.00	USRDTA (BATCHTEST) SPLFNAME (BALANCESTO)	
ORDAUDIT02	24.00	USRDTA (BATCHTEST) SPLFNAME (BALANCEPRD)	
ORDAUDITOO	14.00	USRDTA (BATCHTEST) SPLFNAME (ORDERS)	
ORDAUDITOO	19.00	USRDTA (BATCHTEST) SPLFNAME (BALANCESTO)	
ORDAUDITOO	24.00	USRDTA (BATCHTEST) SPLFNAME (BALANCEPRD)	
<		·	>

PROCEDURES

Select the **Procedures** node to access procedure-related information. This node is available on the navigation pane of the application. Expand the **Procedures** node to reveal four sub-nodes displayed below:



These options are discussed as under:

All Procedures

The first option under the **Procedures** node is **All Procedures**.

Select **All Procedures** to display a list of members. The members in this list have procedures defined in their source code.

	All Pro	cedures option					
🔚 All Procedures List 🛛	3						
All Procedures List, Total Objects: 2261 🖨 🗵 🔻							
Procedure Name	Source Member	Source File	Source Library	^			
<file>_checkRow</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
<file>_deleteRow</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
<file>_insertRow</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
<file>_readRow</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
<file>_readRows</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
<file>_updateRow</file>	ZSTEMPLATE	QRPGLESRC	XASRC				
abbrev	XSRSRV	QRPGLESRC	XASRC				
ACOMMENT	XRRCVUNI	QRPGLESRC	XASRC				
aComment	XRRCVUKY	QRPGLESRC	XASRC				
acvlsActive	XACV	QRPGLESRC	XASRC				
Already_Identified	XBRBDSFK	QRPGLESRC	XASRC				
AnalyseDBF	XDDLANZDBF	QRPGLESRC	XASRC				
AnalyseLF	XDDLANZLF	QRPGLESRC	XASRC	\checkmark			

All Procedures option

Right-click on a row to access the **Zoom Source** or **Variable Where Used** option.

🗐 All Procedures List 🛛			
All Procedures List, Total Objects: 2	261	a 🛛 👻	番 -
Procedure Name	Source Member	Source File Sou	rce Library
<file>_checkRow</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
<file>_deleteRow</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
<file>_insertRow</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
<file>_readRow</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
<file>_readRows</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
<file>_updateRow</file>	ZSTEMPLATE	QRPGLESRC XAS	RC
abbrev 📴 Zoom Source		QRPGLESRC XAS	RC
ACOMME	VI	QRPGLESRC XAS	RC
aCommer Variable Where Use	ed ► (Y	QRPGLESRC XAS	RC
acvlsActive	XACV	QRPGLESRC XAS	RC
Already_Identified	XBRBDSFK	QRPGLESRC XAS	RC
AnalyseDBF	XDDLANZDBF	QRPGLESRC XAS	RC
AnalyseLF	XDDLANZLF	QRPGLESRC XAS	RC
AnalysePF	XDDLANZPF	EVFTEMPF01 XAS	RC
ANALYSEPF	XDDLANZPF	QRPGLESRC XAS	RC 🗸

Context menu on a Procedure Name

Exportable Functions

Select the **Exportable Functions** option to display the list of names of exported procedures and variables in a module, which can be referred to by other modules.

	Exportable Fund	tions List		
🖬 Exportable Functions List 🛛				
Exportable Functions List, Total Ob	jects: 1129	a 🛛 🗸		#A +
Exportable Functions	Module Name	Attribute	Library	^
ELLIPSE	XWUSRV	RPGLE	XAMODS	
ISAVALIDSQLREF	XWUSRV	RPGLE	XAMODS	
PARMYN	XWUSRV	RPGLE	XAMODS	
QUALLOOKUP	XWUSRV	RPGLE	XAMODS	
RTNCPGM	XWUSRV	RPGLE	XAMODS	
XWU_BRACKETED	XWUSRV	RPGLE	XAMODS	
XWU_BUILDSTMT	XWUSRV	RPGLE	XAMODS	
XWU_CHECKPARMFLD	XWUSRV	RPGLE	XAMODS	
XWU_EXCLUDETHISREF	XWUSRV	RPGLE	XAMODS	
XWU_GETDSDEFN	XWUSRV	RPGLE	XAMODS	
XWU_GETEXTPROCNAME	XWUSRV	RPGLE	XAMODS	
XWU_GETEXTRANAMES	XWUSRV	RPGLE	XAMODS	
XWU_GETFMTUPDATEREFS	XWUSRV	RPGLE	XAMODS	~

Right-click on a row to select the **Zoom Source** or the **Variable Where Used** options.

External Procedures

The third option under the **Procedures** node is **External Procedures**. This option registers high-level language program like RPG, Java, C#, etc. as a stored procedure. However, the procedure may or may not use SQL.

Select the External Procedures option to invoke the following window:



🔚 External Procedures Li	ist 🛛							
External Procedures List	t, Total Objects: 27						a 🛛 🗸	<i>#</i> 1
Specific Name	Specific Schema	Routine Name	External Name		External Language			
X@BWUDTA	XAOBJ	X@BWUDTA		XAOBJ/X@B	BWUDTA	CL		
XABGWUI	XAOBJ	XABGWUI		XAOBJ/XAB	GWUI	CL		
XACRTMLK	XAOBJ	XACRTMLK		XAOBJ/XAC	RTMLK	CL		
XADSPOJU	XAOBJ	XADSPOJU		XAOBJ/XAD	SPOJU	CL		
XADTARDR	XAOBJ	XADTARDR		XAOBJ/XAD	TARDR	CL		
XADTARDR2	XAOBJ	XADTARDR2		XAOBJ/XAD	TARDR2	CL		
XAFFNDET	XAOBJ	XAFFNDET		XAOBJ/XAF	FNDET	RPGLE		
XALWSRCBRW	XAOBJ	XALWSRCB		VIABLOUIL	RCBRW	CL		
XARRTVWD1	XAOBJ	XARRTVWD	Data Flow Diagr		WD	RPGLE		
XARTVOBJWU	XAOBJ	XARTVOBJV	Object Where U	lsed	DBJWU	RPGLE		
XBLDSCD	XAOBJ	XBLDSCD	Variable Where Used		, D	RPGLE		
XCEMBLFWU	XAOBJ	XCEMBLFW-	Tunuble Timere	ANOD/ ACL	WULFWU	CL		
XCHKLIB	XAOBJ	XCHKLIB		XAOBJ/XCH	IKLIB	CL		
XCRTLIB	XAOBJ	XCRTLIB		XAOBJ/XCR	TLIB	CL		
XEXCCMD	XAOBJ	XEXCCMD		XAOBJ/XEX	CCMD	CL		
XEXITJ	XAOBJ	XEXITJ		XAOBJ/XEX	UTJ	RPGLE		
XFNSPCMGRT	XAOBJ	XFNSPCMGRT		XAOBJ/XFN	SPCMGRT	CL		
XFNSPCMGR1	XAOBJ	XFNSPCMGR1		XAOBJ/XFN	SPCMGRT	CL		
XJVAINIT	XAOBJ	XJVAINIT		XAOBJ/XJV/	AINIT	CL		
XLICDTLQRY	XAOBJ	XLICDTLQRY		XAOBJ/XLIC	DTLQRY	RPGLE		
XLICD00001	XAOBJ	XLICDTLQRY		XAOBJ/XLIC	DTLQRY	RPGLE		
XLICVERPGM	XAOBJ	XLICVERPGM		XAOBJ/XLIC	VERPGM	RPGLE		
XREFINUSE	XAOBJ	XREFINUSE		XAOBJ/XRE	FINUSE	CL		
XSCNRPTLYT	XAOBJ	XSCNRPTLYT		XAOBJ/XSC	NRPTLYT	CL		
XSECCHK	XAOBJ	XSECCHK		XAOBJ/XSE	ССНК	RPGLE		
XSRVAPP	XAOBJ	XSRVAPP		XAOBJ/XSR	VAPP	RPGLE		
XWRKAS4JB1	XAOBJ	XWRKAS4JB1		XAOBJ/XWF	RKAS4JOB	CL		

Window – External Procedures List

Right-click on a row for the context menu and select the options to view the Data Flow Diagram or the Object Where Used/Variable Where Used references.

SQL Procedures

The last option under the **Procedures** node is **SQL Procedures**. This option presents the entire procedure coded with SQL. The option follows SQL Standard (PSM) and allows 'normal' DDL/DML SQL, in addition to procedural statements.

The following window appears on selecting the **SQL Procedures** option:



	Window – SQL	Procedures		
🗊 SQL Procedures List 🛛 🕄				
SQL Procedures List, Total ()bjects: 164	a 🛛 🔹		# 1 •
Specific Name	Routine Name	External Name	External Language	^
AUTHENTICATECREWUSERID	AUTHENTICATECREWUSERID	MISSYSOBJ/AUTHE00001		
CANEDITPROJECTPHASE	CANEDITPROJECTPHASE	MISSYSOBJ/CANED00002		
CANEDITPROJECTSTEP	CANEDITPROJECTSTEP	MISSYSOBJ/CANED00001		
CD711SQL	CD711SQL	MISSYSOBJ/CD711SQL		
CV505SQL	CV505SQL	MISSYSOBJ/CV505SQL		
CV506SQL	CV506SQL	MISSYSOBJ/CV506SQL		
C20045QL	C20045QL	MISSYSOBJ/C2004SQL		
C2005SQL	C20055QL	MISSYSOBJ/C2005SQL		
C2048SQL	C20485QL	MISSYSOBJ/C2048SQL		
C20495QL	C20495QL	MISSYSOBJ/C2049SQL		
C2050SQL	C2050SQL	MISSYSOBJ/C2050SQL		
C2054SQL	C2054SQL	MISSYSOBJ/C2054SQL		
C20555QL	C20555QL	MISSYSOBJ/C2055SQL		
C2070SQL	C20705QL	MISSYSOBJ/C2070SQL		
C2071SQL	C20715QL	MISSYSOBJ/C2071SQL		
C2072SQL	C20725QL	MISSYSOBJ/C2072SQL		
C2073SQL	C20735QL	MISSYSOBJ/C2073SQL		
C2074SQL	C20745QL	MISSYSOBJ/C2074SQL		
C20755QL	C2075SQL	MISSYSOBJ/C2075SQL		
C20765QL	C20765QL	MISSYSOBJ/C2076SQL		
C20805QL	C20805QL	MISSYSOBJ/C2080SQL		
C20815QL	C20815QL	MISSYSOBJ/C2081SQL		
C24885QL	C24885QL	MISSYSOBJ/C2488SQL		
C2501SQL	C25015QL	MISSYSOBJ/C2501SQL		~

Window – SQL Procedures

Application Area

ADD APPLICATION AREA

X-Analysis creates application areas from part of one or multiple systems. It is possible to subdivide an application, programmatically, into logical modules or areas. This can be within the context of a single system or specific parts from multiple systems. For example, you can have an application area like **ORDERS**, containing Order Entry details from Operational System, to represent single system Application Area. You can also have an application area as **ORDERS**, containing Order Entry details from Operational System from Financial System, representing the application area as a specific part from multiple systems.

The Application Area feature facilitates grouping of an application into different Business Areas. They are defined on the basis of certain criterions called Application Area Rules. Application Area Rules are, hence, a mechanism which categorizes an application into different Application Areas.

You can create an application area by running the X-Analysis Client or using **X4WRKAPP** on IBM i.

Using X-Analysis Plugin

Opt for the context menu on the cross-reference library and select the **New Application Area** option. This brings up a dialog to add a new application area to the selected crossreference library. The dialog takes the Application Area **Name** and **Description** as inputs.

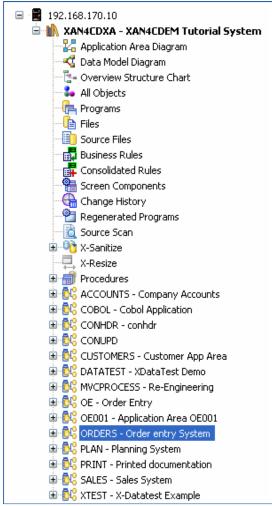
Click **OK** to add the new application area to the cross-reference library.

New Application Area dialog				
🖶 New Application Area 🛛 🛛 🔀				
Name	ORDERS			
Description	Order entry System			
Copy Rule	from an existing Application Area			
ACCOUNTS	×			
	OK Cancel			

New Application Area dialog



New Application Area added



ADDING OBJECT TO AN APPLICATION AREA

Opt for the Object List to add an object to an application area. Double-click on **All Objects** to bring up the **Work with Objects** dialog. Provide the object name to be added to the application area. For example, input **CON001** and click **OK**.

Select **CON001** and opt for the context menu on it. Then, select the **Add to Application Area** option, as shown below:

Add to Application Area option

Application Area Options 🔹 🕨	Add to Application Area 💫
	Add to Application Area with Related Objects
	Omit from Application Area

This option presents the following dialog:



Add to Application Area

€	Add 'CON001'	to Application Area	×
	Application Area:	Description	<u>^</u>
	CONHDR	conhdr	
	CUSEMAINT	New Sub App Area	
	CUSTOMERS	Customer App Area	_
	DATATEST	Data Test Demo	
	DEC16	Test area	
	MVCPROCESS	Re-Engineering	
	OE	Order Entry	
	OE001	Application Area OE001	
	ORDERS	orders	~
	<		
		OK Cancel	

Select the application area in which you want to add the object and click **OK**.

To add the related objects, select the second option i.e. **Add to Application Area with Related Objects**, as shown below:

Add to Application Area with Related Objects option

Application Area Options	•	Add to Application Area	
		Add to Application Area with Related Objects	N
		Omit from Application Area	νč

This option invokes the following dialog:



Add 'CON001'	to Application Area with Related Objects	
Application Area:	Description	^
CONHDR	conhdr	
CUSEMAINT	New Sub App Area	
CUSTOMERS DATATEST	Customer App Area Data Test Demo	
DEC16	Test area	
MVCPROCESS	Re-Engineering	_
OE	Order Entry	
OE001	Application Area OE001	_
ORDERS	orders	~
Options for Related	Objects	
Do hoc includ	e files referenced/updated by this program	¥
Do not includ	e called programs	~
Do not includ	e files referenced/updated by any included program	~
Do not includ	e files referenced/updated by any included program	~
Do not includ	e files referenced/updated by any included program	~
Do not includ	e files referenced/updated by any included program	~

Add to Application Area with Polated Objects

Perform the steps given below:

- 1. Select the application area in which you want to add the object.
- 2. Choose the required options from the three drop-down menus.
- 3. Click OK.

This adds the objects to the application area fulfilling the criterions.

REMOVING OBJECT FROM AN APPLICATION AREA

Opt for the Object List and select the object to be removed from the application area. Right-click for the context menu on that object and select **Omit from Application Area** as displayed below:

•	
Application Area Options 🕨	Add to Application Area
	Add to Application Area with Related Objects
	Omit from Application Area 📐
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

**Omit from Application Area option** 

The following dialog will be displayed:



## **Omit from Application Area dialog**

e	Omit 'CON001'	from Application Area	X
	Application Area: OE OE001 ORDERS PLAN PRINT SALES TEST XTEST COBOL	Description Order Entry Application Area OE001 orders Planning System Printed documentation Sales System test app area X-Test Demonstration Cobol Application	
		OK Cancel	

To remove the object, select the application area name and click **OK**.

# **CONTEXT MENU ON AN APPLICATION AREA**

The context menu on an application area is displayed below:

Context menu on an application	area
Application Area Options	•
Derive Business Rules	
Export Options	•
Annotate	
Document Application Area	
Data Management Options	•
Test Management Options	•
Reengineer Programs	
Generate Programs	
Generate Web Services	
Generate Data Application	
Data Migration	
Audit Options	•
UML Options	•

# Context menu on an application area

# **APPLICATION AREA OPTIONS**

The Application Area Options sub-group consists of the following:

- Update Description
- Remove Application Area
- Application Area Rules
- Affinity Identification
- Affinity Comparison
- New Application Area
- Add to Application Area
- Omit from Application Area

#### Update Description

Select the **Update Description** option to modify the application area description. Change the description and click **OK** to reflect the changes to the application area description.

Undate Description dialog

Opu	Opuale Description dialog			
Update Description				
Name	ACCOUNTS			
Description	Company Accounts			
ОК	Cancel			

#### **Remove Application Area**

Select the **Remove Application Area** option. This prompts for deleting the selected application area. After confirmation it deletes the application area.

#### **Application Area Rules**

Select the **Application Area Rules** option. This invokes a window displaying the available 'Application Area Rules'. These rules determine which objects are to be placed in that particular Application Area. You may update/delete by using the right-click context menu on a row, or add new rules using the **Add** button from the editor toolbar.



## **Application Area Rules dialog**

tion Area Rul	es for ACCOU	NTS				<b>#</b> -
Rule Type	Rule Value	Selection	Object Type	Object Attribute	Object Comparison	Name/Text
Object		Select	Program	*ALL	Equal	CNTCM
Object		Select	Program	*ALL	Equal	CB906R
	Rule Type Object	Rule Type Rule Value Object	Object Select	Rule Type     Rule Value     Selection     Object Type       Object     Select     Program	Rule Type         Rule Value         Selection         Object Type         Object Attribute           Object         Select         Program         *ALL	Rule Type     Rule Value     Selection     Object Type     Object Attribute     Object Comparison       Object     Select     Program     *ALL     Equal

The following dialog will come up when the **Add** button is clicked:

	An	1000	Area Rules		×
	~P	pheation	TATED NUICS		
Seq. No.	8				
Rule Type	Object	~			~
Selection	Select	~			
Object Type	Program	~	Object Attribute	*ALL	¥
Object Comparison		~	Name/Text		
Library Comparison		~	Library Name		
Status	All	~			
Object Usage		~			
Usage Comparison		~	Usage Value		
Incl. Ref'd Pgms	No	~	Pgms Level	9	~
Incl. Ref'd Files	No	~			
Incl. Owning Files	No	~			
Incl. Dependent Files	No	~			
			Add	С	ancel

## Add dialog – Application Area Rules

The various options in the Application Area Rules dialog are described as below:

Feature	Brief Description	
Sequence	The sequence number of the rule, which determines the order in which the rules are processed.	

Feature	Brief Description
Rule Type	Select from:
	<b>Object:</b> This specifies that the scope of the rule type for only an Object. <b>Application Area:</b> This specifies the scope of the rule type for an application area. <b>Problem Analysis:</b> This specifies the scope of the rule type on Problem Analysis Category.
Rule Value	When the Rule Type is set as Application Area, the Rule Value dropdown will display all the application area names; when Rule Type is Problem Analysis, then all the Problem Analysis categories are displayed.
Selection	Defines whether the specified Object(s) should be selected or omitted.
	Choose from:
	S - Select
	O - Omit ' ' - AND - a further condition for the previous
	Select/Omit
	If only Omits are specified then a Select *ALL will be applied when the rules are processed.
Object Type	Choose from:
	<ul> <li>P - Program.</li> <li>E - Entry point program, i.e. a program that calls other programs but is not called by any program.</li> <li>F - File.</li> <li>F - File.</li> <li>* - All Object types.</li> <li>' ' – For an AND line. (The AND line takes the same value as the SELECT/OMIT line.)</li> </ul>
Object	Specify the comparison type:
Comparison	EQ - equal NE - not equal CT - compare text Object Name: An individual name/a generic name/ '*ALL'. Both individual and generic names can have wildcards specified. Enter & to denote that any character is allowable. Thus AAA&1 means that any 5-character name where the first three characters are AAA and the fifth character is 1 will be selected. More examples: AA&&2, OE*.

ature B	rief Description
Object Usage	Specify as follows:
	Last Used: This will select the objects based on the last used
	date.
	Created: This will select the objects based on the Object
	creation date.
	Modified: This will select the objects based on the object change date.
	Days Count: This will select the objects based on the total
	number of days the Object was used.
Usage	Specify as follows:
Comparison	
	Less than
	Less or Equal
	Equal Not Equal
	Greater or Equal
	Greater than
Usage Value	Specify the usage value here. If the usage is Last used, Modified
Usage value	or Created, then value should be a Date in the MMDDYY
	format. If the usage is Days Count, the value should be a
	number.
Library Comparison	Specify the comparison type:
	EQ - equal
	NE - not equal
	Library Name:
	An individual name/a generic name/ '*ALL'.
	If the Library Rule is left blank, it will be treated as equivalent
	to *EQ *ALL.
Object	Specify the attribute of the objects to be selected. The default
Attribute	is *ALL
Name/Text	Fill the name/text of the rule in this box.
Status	For the files, specify the status as:
	*A - Accessed by other files, but does not access any other files.
	*B - Accesses other files and gets accessed by other files
	*C - Only accesses other files, not accessed by others
	*D - Standalone File
	*ALL - This is the default selection.

Feature	Brief Description
	For the programs, specify the status as:
	*A - Parent or top-level program which calls other programs but is not called itself
	*B - Program is called by another and also calls other programs
	*C - Program at end of a program tree and does not call other program
	*D - Standalone Program
Library Nam	Provide the name of the X-Ref Library here.

Click **Add** on the **Application Area Rules** dialog after making your selections. Then click the **Apply Rules** button on the editor toolbar to rebuild the application area as per the specified rules. The same dialog will open if you wish to update the Application Area Rules. The **Update/Delete** options are available on the right-click menu of a rule.

### **Referenced Programs and Referenced Files**

These options only apply to SELECT lines. They allow the user to specify the selection of referenced Objects.

A value of 'A' specified for either option will initiate an iterative process. Each additional dependent Object will have any relevant criteria applied to it to determine any further dependent Objects.

If a value of 'A' is specified for Referenced Programs then referenced programs will also be included for any files selected by Owning File and Dependent File options.

A value of 'U' specified for both options will also initiate an iterative process. Each additional dependent Object will have any relevant criteria applied to it to determine any further dependent Objects.

If a value of 'U' specified for both options then any files included only by virtue of the Owning File or Dependent File options will not be included

### **Referenced Programs**

This option only applies to SELECT lines. It allows you to specify the selection of referenced programs. Select one of:

- Y Yes includes programs called by the specified program or programs, which reference the specified file.
- N No do not include programs called by the specified program.
- U Update programs include programs that update the specified file.

- S Split include programs that are not allocated to any other area and update the specified file.
- A All include programs called by the specified program or programs which reference the specified file or any dependent programs or files.
- V All update programs include programs that update the specified file or any other files, which have been added.
- For an AND line. (The AND line takes the same value as the SELECT/OMIT line.)

Note: When you select to include 'All' program references (or 'All Batch Programs'), a program level from 2 to 9 can be specified. The default value is 'ALL' which brings the entire depth of called programs.

### **Referenced Files**

This option only applies to SELECT lines. It allows you to specify the selection of referenced files. Select one

- Y Yes include files referenced by the specified program.
- N No do not include files referenced by the specified program.
- U Update files include files updated by the specified program.
- A All include files referenced by the specified program or any dependent programs.
- V All update files include files updated by the specified program or any called programs. For an AND line. (The AND line takes the same value as the SELECT/OMIT line.)

### **Owning Files and Dependent Files**

These options only apply to SELECT lines. They allow you to specify the selection of files, which reference the specified file(s).

A value of 'C' (Cascade) will initiate an iterative process, selecting files, which refer to the original file(s) or any further files, which have been selected by this rule.

### **Owning Files**

This option only applies to SELECT lines. If allows you to specify the selection of files which own the specified file(s). Select one of:

Y - Yes - include files, which own the specified file(s).

N - No - do not include files, which own the specified file(s).



C - Cumulative - include files, which own the specified file(s) or any other files, which have been selected.

### **Dependent Files**

This option only applies to SELECT lines. It allows you to specify the selection of files which are owned by the specified file(s). Select one of:

- Y Yes include files, which are owned by the specified file(s).
- N No do not include files, which are owned by the specified file(s).
- C Cumulative include files, which are owned by the specified file(s) or any other files which have been selected by this rule.

Cumulative means including all the dependents of the first file, all the dependents of the dependent files, and so on.

Use F3 to exit.

Press **ENTER** to build Application Area Lists.

#### **Dependencies options**

Tables summarizing the options and their interactions are compiled below.

#### When the selected Object is a Program

Feature	Brief Description
Referenced Programs	N = Do not include any called programs.
, , , , , , , , , , , , , , , , , , ,	Y = Include programs called by the selected program.
	A = Include programs called by the selected program and any programs called by any programs included by this rule.
Referenced Files	N = Do not include any referenced files.
	Y = Include files referenced by the selected program.
	U = Include files updated by the selected program.
	A = Include files referenced by the selected program or by any programs subsequently included by the referenced Program value.
	V = Include files updated by the selected program or by any programs subsequently included by the referenced Program value.
Owning Files	NOT APPLICABLE WHEN THE SELECTED OBJECT IS A PROGRAM.
Dependent Files	NOT APPLICABLE WHEN THE SELECTED OBJECT IS A PROGRAM.

### When selected Object is a File

Feature	Brief Description
Referenced Programs	N = Do not include any called programs.
	Y = Include programs which referenced the selected file.
	U = Include programs which update the selected file.
	A = Include programs which reference the selected file or any files which have been included as owner or dependent files.
	V = Include programs which update the selected file or any files which have been included as owner or dependent files.
	S = Include programs which update the selected file and are not allocated to any other area.
Referenced Files	NOT APPLICABLE WHEN THE SELECTED OBJECT IS A FILE.
Owning Files	N = Do not include any owned files.
	Y = Include files which own the selected file.
	C = Include files which own the selected file or which own those in turn and so on.
Dependent Files	N = Do not include files which are owned by the selected file.
	Y = Include files which are owned by the selected file
	C = Include files which are owned by the selected file or which are owned by those in turn and so on.

### Special case when Referenced Programs and Referenced Files are set to 'U'

Feature	Brief Description
Referenced Programs	U = Include programs which update the selected file or any file added by these rules.
Owning Files	NOT APPLICABLE.
Referenced Files	U = Include files which are updated by the selected program or any program added by these rules.
Dependent Files	NOT APPLICABLE.

Make the appropriate selections in this dialog, for adding or modifying a rule for a specific application area.

# **Affinity Identification**

The **Affinity Identification** option displays the linkage of a program to another program and thereby, helps to identify the objects that do not exist in an application area but have high (or low) affinity to one or multiple programs under that application area, mainly due to data linkages or program dependencies. The affinity calculation is done at the server using the **XAFFINIDX** command.

The Affinity Identification option is shown below:

	Annity Iden		•••••
	Application Area Options	×.	Update Description
4 101	Derive Business Rules		Remove Application Area Application Area Rules
	Export Options	•	Affinity Identification
	Annotate		Affinity Comparison
ď	Document Application Area		New Application Area
	Data Management Options	•	Add to Application Area
0	Test Management Options	·	Omit from Application Area
Ľ	Reengineer Programs		
⊳Ē	Generate Programs		
	Generate Web Services		
	Generate Data Application		
	Data Migration		
Þ	Display Difference Analysis		
⊳ <mark>0</mark> 2 ⊳ <b>0</b> 3 ⊂	Audit Options		
	UML Options		

Affinity Identification option

Select the option to generate a matrix of programs in the application area against the related program objects falling within or outside the selected application area. The affinity is displayed as shown in the following image.



Affinity Identification window					
🚰 Affinity 🕱					
Affinity Identifica	tion for ACCOUN	TS			3
Programs	CB906R	CNTCMAINT	RTNMSGTEXT	X@GSCD	1
CBC110	10	0	0	8	
CL03	0	0	8	0	
CUSFMAINT	0	0	10	0	
CUSFMAINTC	0	0	8	0	
CUSFMOLD	0	0	10	0	
CUSTMNT1	0	0	10	0	
CUSTMNT1_0	0	0	10	0	
CUSTMNT1_1	0	0	10	0	
CUSTMNT1_2	0	0	10	0	
CUSTMNTJR	0	0	10	0	
RTNMSGTEXT	0	10	0	0	
TRNCLPCMD	0	0	8	0	
TRNHSTCLP	0	0	8	0	
WWCONDET	0	0	10	0	
WWCONHDR	0	0	10	0	

Two colors denote the affinity index of the programs with all the objects under the selected application area.

- Red denotes above average Affinity Index.
- Green denotes below average Affinity Index.

The above calculation is done based on the criteria below:

- 1. The program-to-program dependency at the specific depth in the calling sequence.
- 2. The common Database Files used in the specific pair of the programs.
- 3. Exactly matching Business Rules.
- 4. Partially matching Business Rules.

The Affinity calculation is done considering the specific weightage for the above cases. The default calculation settings are shown below (i.e. in "Affinity Index" column):



Туре	Level/Depth	Affinity Index
PGM	1	10
PGM	2	8
PGM	3	6
PGM	4	4
PGM	5	2
PGM	6	2
FILE	N/A	10
BizRle	Exact Match	3
BizRle	Contained	1

Note: The Affinity Identification report can also be exported to MS Excel.

### Affinity Comparison

Select the **Affinity Comparison** option at the application area level to display the comparison of affinity values for all the objects present in that application area versus their affinity in other application areas.

The following image shows the **Affinity Comparison** option.

	Annity Compa	11301	
a 📴 ACCOUN	TS - Company Accounts		
44	Application Area Options	•	Update Description
-≪] [ ]\$ <b>3</b> A	Derive Business Rules		Remove Application Area Application Area Rules
" <u>=</u> - C <b>3</b> ₀ A	Export Options	•	Affinity Identification
<u>р</u>	-		Affinity Comparison
	Document Application Area		New Application Area
	Data Management Options	•	Add to Application Area
	Test Management Options	•	Omit from Application Area

### Affinity Comparison option

Select the option to invoke the following window.



### Affinity Comparison window

🔐 Affinity Com	🖁 Affinity Comparison 🕱 🛛 🗖 🗖						
Affinity Comparison for ACCOUNTS							
Programs	ACCOUNTS	ACHEAD01	BCHEAD01	COBOL	CONHDR	CONUPD	CUSFMAINT
CB906R	10	0	0	0	0	0	0
CNTCMAINT	10	0	0	0	0	0	10
RTNMSGTEXT	10	0	0	0	10	0	10
X@GSCD	10	0	0	0	10	0	10
<							>

The first column displays the selected application area and rest of the columns are the other application areas in the X-Ref library.

The blue color in a specific cell (showing affinity value) represents the presence of that object in the application area corresponding to that column; red color means the object does not exist in the application area but has the highest affinity; green color represents the specific object has highest affinity and is also present in that application area.

# **DERIVE BUSINESS RULES**

The topic has been discussed under the Application Library section.

# **EXPORT OPTIONS**

The topic has been discussed under the Application Library section.

### ANNOTATE

X-Analysis provides the annotation facility for application areas. Select any application area and opt for the context menu on it, then select the **Annotate** option. This invokes a dialog box; provide the required text and click **Save**. The annotation is stored in a table available in the cross-reference library.

# **DOCUMENT APPLICATION AREA**

We will discuss it under the Document Manager section.

# DATA MANAGEMENT OPTIONS

This submenu has the following options:

Verify Data Relationships

- Subset/Archive Filter
- Subset Data
- Archive Data
- Purge Data
- Archive & Purge Data

We shall discuss these options under the Data Management Features section.

# **TEST MANAGEMENT OPTIONS**

This context menu contains various options related to X-Test. The following image displays the options:

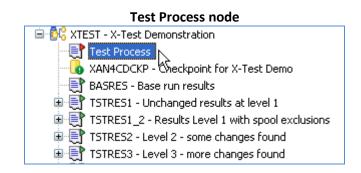
▷         Ô         DA           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C           ▷         Ô         C	Application Area Options   Derive Business Rules  Export Options  Annotate Document Application Area  Data Management Options	
01%         OE           01%         PL           01%         PR           01%         PR           01%         SA           01%         TE           01%         TE           01%         TE           01%         TE	Test Management Options   Reengineer Programs Generate Programs Generate Web Services Generate Data Application Data Migration	Create Checkpoint Definition Create Test Result Definition Create Test Process Definition Create Screen Test Test Result Field Exclusion Test Result Spool File Exclusion
000         TE           000         TE           000         TE           000         TE           000         TS           000         TS	Display Difference Analysis Audit Options UML Options	

### **Test Management Options**

### **Create Test Process Definition**

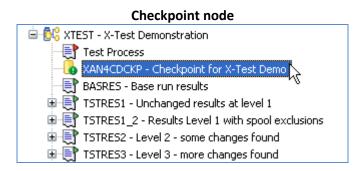
The **Create Test Process Definition** is used to define the test process. It creates **Test Process** node under the application area. The following screen displays the available Test Process node; it comes pre-configured with the tutorial application – **XAN4CDXA**.





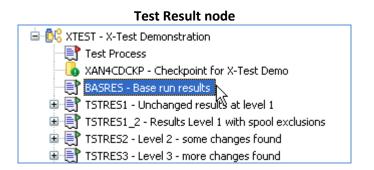
# **Create Checkpoint Definition**

This option is used to create checkpoints. The checkpoint acts as an image of the test data. The tutorial application has a pre-defined checkpoint – **XAN4CDCKP**. The following screen displays the checkpoint:



# **Create Test Result Definition**

Create the **Test Result Definition** in order to save the test process results. The tutorial application is pre-configured to have a Test Result Definition – **BASRES**. The following screen displays the test result definition:



# **Test Result Field Exclusion**

This option lists all the files (PFs) under the application area, so that you can select any field for exclusion purpose. The following screen displays the field exclusion window:



### Test Result Field Exclusion

Field Exclusion 🛛 🗖 🗖						
Test Result Field Exclusion A						
File/Field	Field Type	Length	Description	Ommitted		
🔳 CONDET						
🗄 CONHDR						
🕀 CUSTS						
STKBAL						
🗄 STKMAS						
🗄 STOMAS						

Expand a file to display the fields of that file.

Field Exclusion 🛛 🖓					
Test Result Field Exclusion				<b>#</b> •	
Field Type	Length	Description	Ommitted		
S	8	Contract			
A	8	Product			
А	8	Store			
А	8	Ref No			
А	8	Trn Hst Trn Type			
S	8	Contract Qty			
А	8	Stk Unit of Measure			
S	8	Price			
	Field Type S A A A A S A A	Field TypeLengthS8A8A8A8A8A8A8A8A8A8A8A8A8A8A8A8A8	Field TypeLengthDescriptionS8ContractA8ProductA8StoreA8Ref NoA8Contract QtyA8Stk Unit of Measure	ExclusionField TypeLengthDescriptionOmmittedS8ContractA8ProductA8StoreA8Ref NoA8Trn Hst Trn TypeS8Contract QtyA8Stk Unit of Measure	

### **Test Result Field Exclusion – Expanded**

The keyed fields are displayed in RED. To exclude a field, select any field other than the keyed fields and opt for the context menu:



Field Exclusion option					
🕙 Field Exclusion 🛛					
Test Result Field Ex	clusion				#A •
File/Field	Field Type	Length	Description	Ommitted	
CONDET					
XWORDN	S	8	Contract		
XWABCD	A	8	Product		
XWAACS	A	8	Store		
XWT8TX	А	8	Omit from Result con	nparison	
XWRICD	A	8	<b>☆Trn Hst Trn Type</b>		
XWA5QT	S	8	Contract Qty		
XWA2CD	A	8	Stk Unit of Measur	в	
XWPRIC	S	8	Price		
🗄 CONHDR					
🕀 CUSTS					
🗄 STKBAL					
STKMAS					
STOMAS					

On selecting the exclusion option, Omit from Result comparison, the window gets updated and starts displaying **O** against the omitted field, as displayed below:

		L L	Jmillea Field		
Field Exclusion	×				
Test Result Field	Exclusion				#8 -
File/Field	Field Type	Length	Description	Ommitted	^
CONDET				0	
XWORDN	S	8	Contract		
XWABCD	A	8	Product		
XWAACS	A	8	Store	0	
XWT8TX	A	8	Ref No	6	
XWRICD	A	8	Trn Hst Trn Type		
XWA5QT	S	8	Contract Qty		
XWA2CD	A	8	Stk Unit of Measure		
XWPRIC	S	8	Price		~

**Omitted Field** 

In order to clear field omission, select the omitted field and select the Clear Criteria option from the context menu.



### **Clear Field Omission option**

est Result Field	Exclusion				<b>#</b>
File/Field	Field Type	Length	Description	Ommitted	
CONDET				0	
XWORDN	S	8	Contract		
XWABCD	A	8	Product		
XWAACS	Α	8	Store	0	
XWT8TX	A Cle	ar Criteria	f No		
XWRICD	A A	8	Trn Hst Trn Type		
XWA5QT	s	8	Contract Qty		
XWA2CD	А	8	Stk Unit of Measure		
XWPRIC	S	8	Price		
CONHDR					
CUSTS					
🗉 STKBAL					
STKMAS					
STOMAS					

### **Test Result Spool File Exclusion**

There are some fields that may 'pollute' the test results during the test data comparison process. The **Test Result Spool File Exclusion** option helps you to exclude such polluted fields. On selecting this option, you will invoke a new window for Spool File Exclusion. The following screenshot displays the Spool File Exclusion window:

#### Window – Spool File Exclusion

🔁 Spool File Exclusion 🛛 🦳 🗖 🗖						
Test Result 9	Spool File Exclusion		8	#1 -		
Spool Name	Spool Description/Recognition Value	Recognition Start Postion	Recognition Length	Exclusion		
<			)	>		

You can add a new spool file by clicking the **Add Spool File** icon, as shown below:

Add Spool File icon						
🖹 Spool File Exclusion 🛛 📃 🗖						
Test Result Spool File Exclusion			8	#A •		
Spool Name	Spool Description/Recognition Value	Recognition Start Postion	Recognition Length	Exclusion		
			Add Spool File			

The following dialog box is invoked:

### Dialog – Add Spool File

🎦 Spool File Exclusion 🕱 🧧 🗖						
Test Result 9	Spool File Exclusio	n		8		<b>#</b> •
Spool Name	Spool Description/	Recognition Value	Recognition Start Postion	Recogni	tion Length	Exclusion
		🖨 Add Spool	File			
		Spool Name				
		Spool Descriptio	n			
			OK Cancel			
<						>

Provide the **Spool Name** and the **Spool Description** in the above dialog. Click **OK** to add the Spool File to the Spool File Exclusion window. In the following screenshot, the added Spool File is displayed:

### Spool File Exclusion window displaying the added Spool File

🖹 Spool File Exclusion 🛛 📃 🗖						
Test Result Sp	oool File Exclusion	8	#A •			
Spool Name	Spool Description/Recognition Value	Recognition Start Postion Recognition Length	Exclusion			
ORDERSPL	Eliminate date/time differences					
<			>			

The next step will be to add exclusion criteria to the spool file. For this, select the spool file and right-click on it for the context menu. The menu contains a single option called **Add Criteria**.

#### Add Criteria option – Spool File context menu

😤 Spool File Ex	clusion 🛛		
Test Result Sp	oool File Exclusion	8	AA -
Spool Name	Spool Description/Recognition Value Re	ecognition Start Postion   Re	cognition Length Exclusion
ORDERSPL	Eliminate date/time differences		
	ADDA	Criteria	
<	ш.		>

Click the **Add Criteria** option to invoke the following dialog:



Add Criteria dialog					
🖨 Add Criteria					
Recognition Value					
Recognition Start Postion					
Recognition Length					
Exclusion Start Position					
Exclusion Length					
S/O Type					
ОК	Cancel				

Provide the necessary criterions in the dialog box and click **OK** to add the criterions under the selected Spool File in the Spool File Exclusion window. Follow the same sequence of steps to add more Spool Files as per requirement.

For more details, refer to the X-DataTest User Manual.

# **REENGINEER PROGRAMS**

Refer to the Reengineer Programs section.

### **GENERATE PROGRAMS**

Refer to the Generate Programs section.

# **AUDIT OPTIONS**

For detailed description, refer to the Audit Options section given below.

# **UML OPTIONS**

The **UML Options** menu has the following two options:

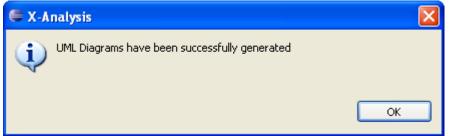
- Re-generate UML
- View App Area Class Diagram

### **Re-generate UML**

The **Re-generate UML** option is specific to application areas. When a user selects this option, then both the UML diagrams – Activity and Class diagrams are re-generated for the selected application area. When the process is over, the following dialog is displayed:



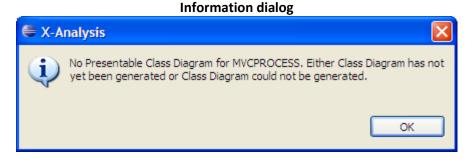
### Information dialog



### View App Area Class Diagram

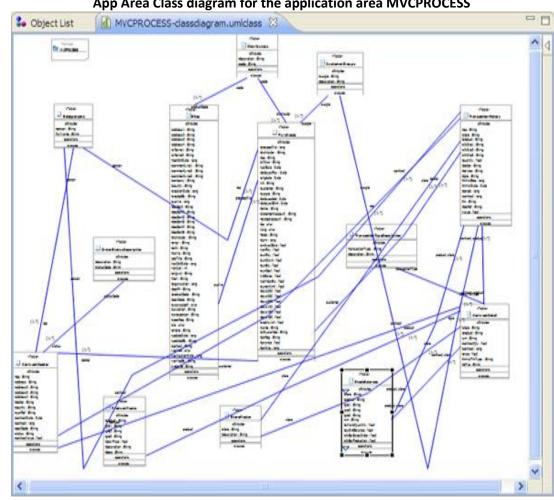
The **View App Area Class Diagram** option is specific to application areas. This is a special class diagram which displays all the objects available in the application area.

The following dialog is displayed when either the class diagram does not exist or the UML diagrams were not generated for the application area:



In order to view the class diagram for the application area, you must execute the **Re**generate UML option.





#### App Area Class diagram for the application area MVCPROCESS

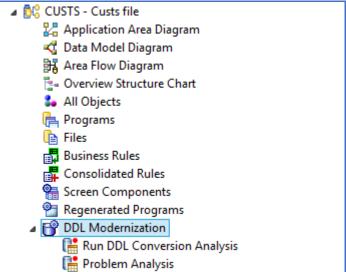
# **DDL MODERNIZATION NODE ON AN APPLICATION AREA**

The conversion of DDS into DDL is intended for the clients planning to modernize their databases to get the enhanced DDL features. Below are some of the benefits:

- 1. Better data integrity (data validation is performed at Write/Update, unlike in DDS where the validation is performed on a read)
- 2. Access to new data types not supported in DDS (identity columns, BLOBs, CLOBs, DataLinks etc.)
- 3. Better read performance.

### DDS to DDL – X-Analysis

In X-Analysis, enhancing the maintainability of databases by converting from DDS to DDL can be achieved via the DDL Modernization node. This feature is only available for application areas. When an application area is expanded, the **DDL Modernization** node appears under it as shown below:



There are two sub-nodes under the DDL Modernization node. These are:

- Run DDL Conversion Analysis
- Problem Analysis

LEGACY

### Add Conversion Library

Right-click on the **DDL Modernization** node for the **Add Conversion Library** option. This will invoke the **DDL Conversion Setup** dialog.

DDL Modernization node – Add Conversion Library option
⊿ 📴 CUSTS - Custs file
🌄 Application Area Diagram
🕰 Data Model Diagram
計 Area Flow Diagram
🚰 Overview Structure Chart
🐉 All Objects
🚘 Programs
🕒 Files
📑 Business Rules
Consolidated Rules
🚝 Screen Components
管 Regenerated Programs
DDL Modernization
Run DDL Conve Add Conversion Library
👫 Problem Analysis



Through this dialog you can formulate a new DDL conversion setup.

DDL Conversion Setup dialog						
DDL conversion Setup						
Name Description	OK Cancel					

Provide the **Name** and **Description** (adding **Description** is optional). The following image shows the name of the new DDL set up.

### **DDL Conversion Setup dialog with Name**

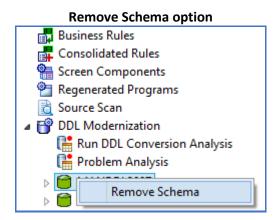
DDL conversion Setup
Name RMTDDL Description
OK Cancel

Click **OK**. The new node will appear as shown in the following image.

RMTDDL node			
a 📴 CUSTS - Custs file			
🛂 Application Area Diagram			
🗠 🖓 Data Model Diagram			
💱 Area Flow Diagram			
📲 Overview Structure Chart			
指 All Objects			
🖶 Programs			
🕒 Files			
🛱 Business Rules			
Consolidated Rules			
🖀 Screen Components			
🕙 Regenerated Programs			
DDL Modernization			
📑 Run DDL Conversion Analysis			
📑 Problem Analysis			
Final Sector			



You may delete the newly-created node. Right-click on the node to select the **Remove Schema** option. The option is shown in the following image.

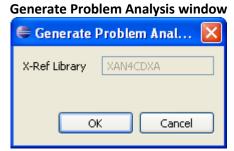


A confirmation dialog will appear asking you to confirm the deletion. The action removes the node from the Client UI and the table, although the schema library will continue to exist in the database and you must manually remove it.

Note: It is vital that if any PFs or LFs are converted, they have the same format level identifiers as the original in order to prevent repetitive level checks.

### **Run DDL Conversion Analysis**

Select this option to invoke the following dialog:



Click **OK** to submit a batch job. The following window displays the progress of the batch job.

C Progress 🛛	*	$\bigtriangledown$	
XPRBANLDDL/SKHAN/668561			
*JOBQ			

#### **Batch Job Progress view**

**FRESCHE** LEGACY

At any point, while the batch job is running, click on the hyperlink (*JOBQ) to view the Job Log. The Job Log view is shown below:

Generate Problem Analysis - Log	×
Generate Problem Analysis	
Command: XPRBANLDDL XRFLIB(XAN4CDXA)	
Library List: XAN4CDXA XAOBJ QGPL QTEMP	
(	
Job Log	
- Mon Dec 01 19:10:49 IST 2014: XPRBANLDDL XRFLIB (XAN4CDXA)	^
	~
	ОК

# **Problem Analysis**

Problem Analysis contains specific information related to DDL conversion issues.

Double-click on the **Problem Analysis** option. The following image presents the conversion issues (like PFs with non-unique key) for the application area, **CUSTS**.

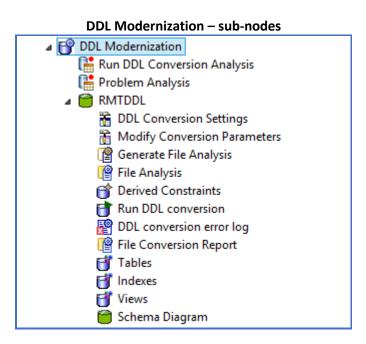
roblem Analysis data for CUSTS - Total Problems: 19			🖨 🗽 🗵 🔻	<i>#</i> 4
Alert/Category/Object	Total	Description	Source Detail	Object Libr
DDL Conversion Issues	5			
File is a Joined logical	1			
ORDBALDTL			XAN4CDEM/QDDSSRC(ORDBA	XAN4CDE
> PF with non-unique key	6			
b LFs referenced by embedded SQL	7			
LFs referenced by Query	1			
CUSTSL1		by Cus Grp/Customer	XAN4CDEM/QDDSSRC(CUSTSL1)	XAN4CDE
Foreign Key value does not match parent key value	4			
CONDET			RMTDDL/QDDLSRC(CONDET)	RMTDDL
CONHDR			RMTDDL/QDDLSRC(CONHDR)	RMTDDL
PROJECT			RMTDDL/QDDLSRC(PROJECT)	RMTDDL
TRNHST			RMTDDL/QDDLSRC(TRNHST)	RMTDDL

<b>Problem Analy</b>	sis window
----------------------	------------



# **DDL Conversion – RMTDDL**

The sub-nodes under the new node are shown below:



### **DDL Conversion Settings**

When the **DDL Conversion Settings** option is clicked, the following dialog is invoked.

· A)



~
Declare as Primary Key
N
DX
Restore Original Triggers
Retain Journal Info

The Generation method of DDL conversion is as follows:

Basic Conversion:

(PP DDL C

(i) PF with Unique key will be created as Table with Primary key.

(ii) PF with non-UNQ key will be suffixed surrogate table without key and Index with the key will be created with PF name.

- (iii) PF without key will be created as table.
- (iv) LF will get converted to DDL indexes/views as applicable.
- Surrogate Table for Keyed PFs and Index for PF keys:
- (i) & (ii) Tables wiil be created with suffixed name + index with PF name
- (iii) Table as specified above
- (iv) same as above
- Surrogate Table for PF and DDS LF for original PF fields/keys.
- (i), (ii) & (iii) suffixed surrogate table + DDS LF with PF name
- (iv) same as above

Surrogate Table for PF and DDS LF for PF and all Access Paths.

(i), (ii) & (iii) - as above

(iv) DDS LF method of indexes/views.

Check the other relevant boxes as per the conversion requirements, and then click Apply.

Note: The Import Column Template in the image provided above is disabled. To enable this feature, the XDDLTMPLTE table must be populated manually from the IBM i screen.

#### **Modify Conversion Parameters**

Double-click the **Modify Conversion Parameters** option to invoke the following window.

DL Conversion Error log	DDL Conversion Setup	
L Conversion Setup For RMTD	DL	
Copy data to new tables	*YES v	^
Name of new SCHEMA	RMTDDL	
Naming option	*SYS ¥	
Date format	*JOB ¥	
Date separator	*JOB ¥	
Time format	*ISO ¥	
Time separator	*JOB ¥	
Decimal separator	*PERIOD ¥	
Apply		
		Y

Window displaying DDL Conversion Setup dialog

Modify the conversion parameters as is required. Then, click **Apply** to implement the changes.

#### Generate File Analysis

When you select the Generate File Analysis option, the following dialog will be invoked.



Generate File Analysis		
X-Ref Library	XAN4CDXA	
Application Area	CUSTS	
Conversion Library	RMTDDL	
OK	Cancel	

Click OK.

### File Analysis

When you select the **File Analysis** option, a list will be presented displaying all the files. These files are sorted to be rebuilt as SQL Index, LF, rebuilt directly as SQL Tables, or Unspecified category.

The following screenshot shows the File Analysis list for application area, CUSTS.

le Analysis list for CUSTS				ê 2	· ·	<u>a</u> ta
Category/Object	Description	Туре	Attribute	Object Library	Source Library	Source File
To be rebuilt as SQL Index	Count:49					
> To be rebuilt as LF	Count:13					
To be rebuilt directly as SQL Tables	Count:8					
CONDET	Contract Detail	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
CONHDR	Contract Header	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
CUSF	Sites	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
CUSGRP	Customer Groups	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
CUSTS	Purchases	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
PROJECT	Projects	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
PROTRK	Project Tracking	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
TRNHST	Transaction History	TABLE	PF	XAN4CDEM	XAN4CDEM	QDDSSRC
Unspecified Category	Count:2					
ASTATUSL1	Non-keyed LF	VIEW	LF	XAN4CDEM	XAN4CDEM	QDDSSRC
ORDBALDTL		VIEW	LF	XAN4CDEM	XAN4CDEM	QDDSSRC

File Analysis window

#### **Derived Constraints**

Derived constraints are optionally generated during DDL modernization. These constraints are derived from the Data model.

The validity of the constraints is determined during problem analysis; the entries which are invalid are reported as usual in the **DDL Modernization->Problem Analysis** node.

#### **Run DDL conversion**

LEGACY

When you double-click on the Run DDL conversion option, the following dialog shows up:

Run DDL conversion dialog				
😂 💦 Run DDL coi	nversion 🛛 🗙			
Cross Reference Library	XAN4CDXAT			
Name of new SCHEMA	RMTDDL			
Application Area	CUSTS			
Compilation Type	*INLINE V			
ОК	Cancel			

Choose the **Compilation Type** from the drop-down menu. The default option is ***INLINE**. Click **OK**.

#### DDL conversion error log

The **DDL conversion error log** lists the record of errors which occurred during the DDL conversion process.

#### File Conversion Report

The File Conversion Report lists all the objects for conversion under the given categories – To be rebuilt as SQL Index, To be rebuilt as Table with LF for existing name, To be rebuilt directly as SQL Tables and Unspecified category. This window is similar to the File Analysis window.

The following screenshot shows the **File Conversion Report** for **CUSTS**. It gives the total count for the objects falling under each category.



### **File Conversion Report for CUSTS**

🖨 🗵 🔻	A
Description	
Count:56	
Count:13	
Count:14	
Count:1	
	Description Count:56 Count:13 Count:14

When you expand each category, the details of the files are presented as shown below.

This details show data after the conversion has been performed. This is seen in the Format level identifier columns for before and after conversion. Moreover, the record count before and after conversion can also be seen.

	onversion Report	×								-
ile Conversion Report for CUSTS 🖨 🗵 🔻						A				
Category/Object	Description	Object Library	Source Library	Source File	Target Library	Target File	Frmt Id Before	Frmt Id After	Rec Bef	Rec After
> To be rebuilt as SQL Index	Count:56									
To be rebuilt as Table with LF for existing	Count:13									
ASTATUS	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	2FD29BC8C74	2FD29BC8C74	0	0
CONDETL1	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	432B98FF0135C	432B98FF0135C	0	0
CONDETL2	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	432B98FF0135C	432B98FF0135C	0	0
CONDETL3	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	432B98FF0135C	432B98FF0135C	0	0
CUSTSL1	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	49C1211A71718	49C1211A71718	0	0
CUSTSL2	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	49C1211A71718	49C1211A71718	0	0
CUSTSL4	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	49C1211A71718	49C1211A71718	0	0
CUSTSL5	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	49C1211A71718	49C1211A71718	0	0
DISTS	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	2B06DADC49	2B06DADC49E	0	0
LISTS	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	2CE87CAEEC	2CE87CAEECC	0	0
ORGS	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	33E7A236EC196	33E7A236EC196	0	0
PTYPES	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	304D50AA4C	304D50AA4C1	0	0
SLMEN	Logical file cr	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDSSRC	1DD9402FDD	1DD9402FDDA	0	0
> To be rebuilt directly as SQL Tables	Count:14									
Unspecified Category	Count:1									
ASTATUSL1	View created	RMTDDL	XAN4CDEM	QDDSSRC	RMTDDL	QDDLSRC	2FD29BC8C74	2FD29BC8C74	0	0

### **Detailed view of File Conversion Report**

### Tables

Double-click the **Tables** sub-node to invoke the following window. It presents the names of all the Tables for **RMTDDL**. Each table is also assigned a system table name.



### Window displaying Tables for RMTDDL

🔂 Tables 🛛							
Tables For RMTDDL, Total Objects: 14	Tables For RMTDDL, Total Objects: 14						
Table Name	System Table Name	Table Schema					
TRANSACTION_HISTORY_TRNHST	TRNHST	RMTDDL					
STATUS_FILE_ASTATUS	ASTATUSXQ	RMTDDL					
CONTRACT_DETAIL_CONDET	CONDET	RMTDDL					
CONTRACT_HEADER_CONHDR	CONHDR	RMTDDL					
CUSF	CUSF	RMTDDL					
CUSTOMER_GROUPS_CUSGRP	CUSGRP	RMTDDL					
PURCHASES_CUSTS	CUSTS	RMTDDL					
DISTRIBUTORS_DISTS	DISTSXQ	RMTDDL					
LISTSXQ	LISTSXQ	RMTDDL					
ORGANISATIONS_ORGS	ORGSXQ	RMTDDL					
PROJECTS_PROJECT	PROJECT	RMTDDL					
PROJECT_TRACKING_PROTRK	PROTRK	RMTDDL					
PRODUCTS_PTYPES	PTYPESXQ	RMTDDL					
SALESPERSONS_SLMEN	SLMENXQ	RMTDDL					

The table names have a right-click option, **Zoom Source** to invoke the Source List for that table. Select the **Zoom Source** option to invoke the following window:

### Source List window – CUSF

💕 Views 🛛	🕤 Tables 🛛 🖹 🔍 CUSF 🛛		
Source List of	CUSF in RMTDDL/QDDLSRC, Lines: 128,	View Level: 5	<i>8</i> 43 -
🗏 🔻 🗈 🖶 🛛	🖻 🕶 🛄 🔻 📃 i 🔉 🖛 🖨		
Seq No	*+ 1+ 2+.		6^
0001.00	Generate SQL		
0002.00	Version:	V7R1M0 100423	
0003.00	Generated on:	22/06/15 12:06:51	
0004.00	Relational Database:	S108B00R	
0005.00	Standards Option:	DB2 for i	
0006.00			~
<			>

### Indexes

Double-click the **Indexes** sub-node to display the index names. Similar to the Tables, each index is assigned a System Index Name.



#### Window displaying Indexes for RMTDDL

Indexes For RMTDDL, 1	Total Objects: 56		
Index Name	System Index Name	Index Schema	
CONDETL1	CONDETL1	RMTDDL	
CONDETL2	CONDETL2	RMTDDL	
CONDETL3	CONDETL3	RMTDDL	
CONHDRL1	CONHDRL1	RMTDDL	
CONHDRL1A	CONHDRL1A	RMTDDL	
CONHDRL2	CONHDRL2	RMTDDL	
CONHDRL3	CONHDRL3	RMTDDL	
CONHDRL4	CONHDRL4	RMTDDL	
CONHDRL5	CONHDRL5	RMTDDL	
CUSFLA	CUSFLA	RMTDDL	
CUSFLB	CUSFLB	RMTDDL	
CUSFLC	CUSFLC	RMTDDL	

Right-click on an index name to invoke the **Zoom Source** option. The following image shows the Source List for a selected Index name:

### Source List window – CONDETL1

付 Indexes	🗟 Condetli 🛛		
Source List of (	ONDETL1 in RMTDDL/QDDLSRC, Lines: 1	3, View Level: 5	希 -
🗏 🕶 🖹 🖷 🕻	P ▼ Щ ▼ 🗐 i 🗵 ▼ 🖨		
Seq No	*+ 1+ 2+	. 3+ 4+ 5+ 6	^
0001.00	Generate SQL		
0002.00	Version:	V7R1M0 100423	
0003.00	Generated on:	22/06/15 12:06:57	
0004.00	Relational Database:	S108B00R	
0005.00	Standards Option:	DB2 for i	
0006.00			
0007.00	CREATE INDEX CONDETL1		
0008.00	ON CONDET ( XWAACS ASC ,	XWORDN ASC , XWABCD ASC )	
0009.00	;		~
< .			>

#### Views

Select the **Views** sub-node to invoke the window listing the Table Name besides the System View Name. The screenshot below presents the Views window:

### Window displaying Views for RMTDDL

Views For RMTDDL, Total Objects: 1					
Table Name	System View Name	Table Schema			
ASTATUSL1	ASTATUSL1	RMTDDL			

Select the **Zoom Source** option to invoke the Source List window.

	Source List windo	w – ASTATUSL1	
📑 Views 🛛 🔋	ASTATUSL1 🛛		
Source List of A	STATUSL1 in RMTDDL/QDDLSRC, Lines: 2	4, View Level: 5	<b># -</b>
🗏 🔻 🗈 🖶 🖡	🖥 🕶 🛄 🔻 🚍 i 🗵 🖛 🖨		
Seq No	*+ 1+ 2+	3+ 4+ 5+	6^
0001.00	Generate SQL		
0002.00	Version:	V7R1M0 100423	
0003.00	Generated on:	22/06/15 12:06:56	
0004.00	Relational Database:	S108B00R	
0005.00	Standards Option:	DB2 for i	
0006.00			
0007.00	CREATE VIEW ASTATUSL1 (		
0008.00	STATUS ,		
0009.00	STSTXT )		× .
<			>

Note: Zoom Source displays the source from QDDLSRC, if existing in the given library. Otherwise, the image of DSPFFD would be displayed.

### Schema Diagram

Select the **Schema Diagram** option to invoke the block diagram for the entire schema. The diagram shows the files and relation among the files. Various relevant details like the primary keys, foreign keys, columns are presented in the Schema Diagram.



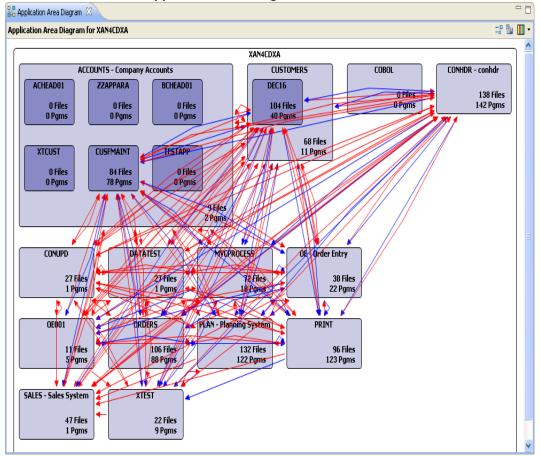
-		am for RMTDDL	
DDL Conversion Error log	📔 File Conversion Report  🗎 RN	ATDDL 🛛	
ODL Schema Diagram for RM	TDDL		
ASTATUSL1 Columns STATUS STSTXT	CONDET Primary Keys PRODUCT CONTRACT PRODUCT STORE REF_NO TRN_HST_TRN_TYPE CONTRACT_QTY STK_UNIT_OF_MEASURE PRICE	CONHDR Primary Keys CONTRACT DEBTOR CUST_REF CONTRACT_DATE STATUS REP CONTRACT_VALUE ADDRESS ADDRESS_2 ADDRESS_3 ADDRESS_4 POST_CODE COUNTRY	CUSF Columns COMPANY DISTRIBUTOR STATUS PHONE EXTN LAST_CONTACT_DATE NEXT_CONTACT_DATE CONTACT SALUTATION JOB_TITLE FAX_NO EMAIL WEBSITE ADDRESS_1 ADDRESS_2 ADDRESS_3 ADDRESS_4 COUNTRY POST_CODE CUS_NO COMMENT_LINE_1 COMMENT_LINE_1

# **Application Area Diagramming**

# **APPLICATION AREA DIAGRAM**

X-Analysis allows easy subdivision of an application into business areas or application areas. You can split the application areas further into sub-application areas for better application analysis. For analyzing an application/application area, X-Analysis provides another diagrammatic construct called Application Area Diagram.

The Application Area Diagram helps in visualizing the relationships between various applications areas. When selected for the entire cross-reference library, the **Application Area Diagram** option displays all the application areas and sub-application areas.



#### **Application Area Diagram for XAN4CDXA**

The bluish-grey blocks represent an application area. The size of the box is indicative of number of objects it contains. A larger box has more objects as compared to a smaller box.

The Application Area Diagram displays colored arrows – Red and Blue.

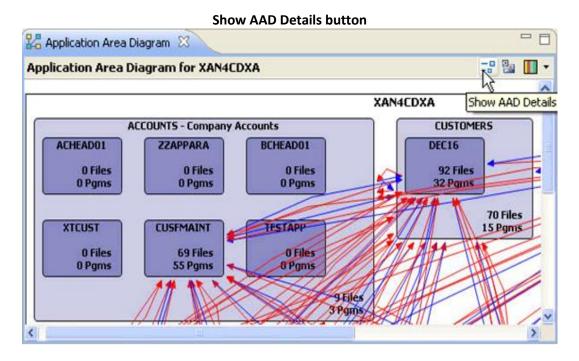
**Blue Arrow** – Displays Program-to-Program calls. The blue arrow points towards the application areas which has more calling programs.

**Red Arrow** – Program-to-File references are displayed with distinct red arrows.

In case a program from both application areas refers to files of the other application areas, then there should be two distinct red arrows.

### **Application Area Diagram Details View**

The Application Area Diagram provides an option to view the Application Area Diagram details. Click **Show AAD Details** on the Application Area Diagram toolbar.



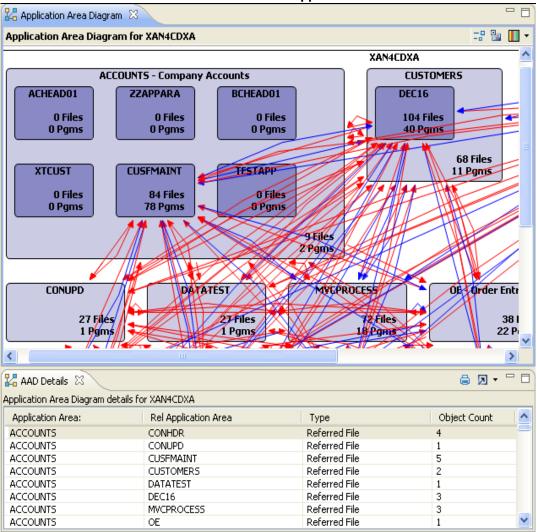
A new window displaying the relationship details for all the application areas will be invoked.



	Application Area Diagra	m details for XAN	4CDXA	
🕌 AAD Details 🛛			<b>a</b>	🛛 - 🗆 🗖
Application Area Diagram de	tails for XAN4CDXA			
Application Area:	Rel Application Area	Туре	Object Count	^
ACCOUNTS	COBOL	Referred File	1	
ACCOUNTS	COBOL	Called Program	1	
ACCOUNTS	CONHDR	Referred File	2	
ACCOUNTS	CUSEMAINT	Referred File	4	
ACCOUNTS	CUSEMAINT	Called Program	1	
ACCOUNTS	CUSTOMERS	Referred File	1	
ACCOUNTS	CUSTOMERS	Called Program	1	
ACCOUNTS	DEC16	Referred File	2	
ACCOUNTS	DEC16	Called Program	1	
ACCOUNTS	MVCPROCESS	Referred File	2	
ACCOUNTS	ORDERS	Referred File	1	~

-. •• ..

The Show AAD Details displays limited records, if a particular application area is selected from the Application Area Diagram.



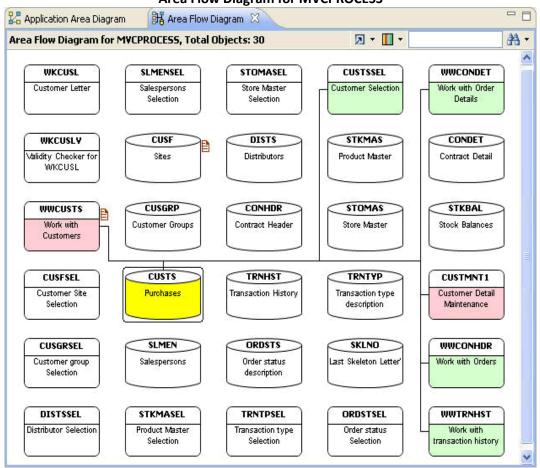
AAD details for selected Application Area

# **AREA FLOW DIAGRAM**

The Area Flow Diagram (AFD) can be generated for an individual application area.

Select the **Area Flow Diagram** option to display programs and files in an application area along with the relations among them. The default selection is on the file which has the most referring programs.

The following screen displays the AFD for the application area, **MVCPROCESS**.



### Area Flow Diagram for MVCPROCESS

# Legend

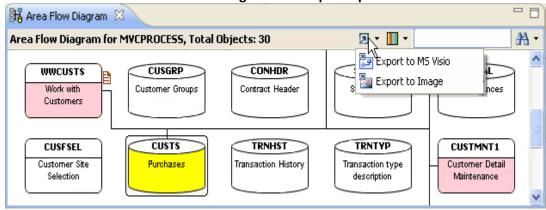
The nature of the programs and the files can be established through the AFD **Legend** bar. The image is shown below.



		AFD with Legen	d	
🔡 Area Flow Diagra	am 🛛			- 8
Area Flow Diagram	m for MVCPROCESS, Tot	al Objects: 30	× 🛛 🔀	#A -
WWCUSTS	CUSGRP	CONHDR	STON	_b^
Work with Customers	Customer Groups	Contract Header	Store N 🔲 Input	ces
			Cutput	
CUSFSEL	CUSTS	TRNHST	TRN1 Update	1
Customer Site Selection	Purchases	Transaction History	Transacti descrij	etail
			Calling Program	
<		1111		

- Selected Object This depicts the object on which you have made the selection. The highlighted objects are those referred to by the object.
- Input This depicts the input file if program is selected, and a program receiving input if file is selected.
- Output This depicts the output file if program is selected, and a program writing output if file is selected.
- **Update** This depicts the Update file.
- **Called Program** This depicts the program called by other programs.
- **Calling Program** This depicts the program calling other programs.

Click **Export Options** and select to export the generated AFD into either **MS Visio** or **Image**.



Area Flow Diagram with Export Options

# **Quick Reference to an Object**

X-Analysis is loaded with various options that provide more information regarding the various objects/members. These options let you to refer to any given object in quick time, and also provide relevant information and/or diagrammatic presentations, as is required.

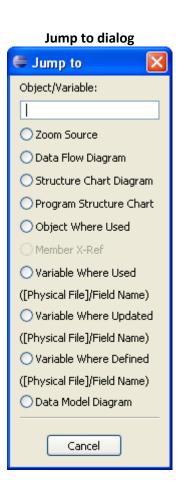
Feature	Brief Description
Jump to	Displays all the options available for a specified member, object or variable for fast access to Source Browser, DFD, Structure Chart, PSC, Object Where Used, Source cross-reference, Variable Where Used and DMD.
Source Browser View	Displays source code of the selected member. Provides various options related to the source code.
Object Where Used	Displays all the instances of an object in the application.
Variable Where Used	Displays all the instances of the specified variable in the application.
File Field Details	Displays the Field Details for a file.
LFs / Access Paths	Displays all Access Paths for the selected Physical File.
Member X-Ref	Displays all the instances of the specified variable in the source code. This is available only on the Source Browser view.
Enhanced Member X-Ref	Displays the references of a variable in the member, along with the information.
Add Bookmark	Displays the bookmarked source lines, besides allowing you to edit bookmarks as per requirement.
More Info	Displays detailed object Information like name, library, type, attribute, etc.

# JUMP TO DIALOG

The primary requirement of an analyst working with a case tool is to get quick and ample information about an object. X-Analysis facilitates this by providing faster access to the objects using the **Jump To** utility. This utility is accessible from any screen using the **Jump To** button on the toolbar.

**Jump to** displays all the options available for a specified member, object, or variable for fast access to Source Browser, DFD, Structure Chart, PSC, Object Where Used, Member X-Reference, Variable Where Used and DMD.





Options	Each option acts on the Object/Variable specified in the selection edit box
Zoom Source	Zooms the source code of the object.
Data Flow Diagram	Displays the Data Flow Diagram of the object.
Structure Chart Diagram	Displays the Structure Chart of the object.
Program Structure Chart	Displays the sequence of calls within the program.
Object Where Used	Displays all the instances of an object in the application.
Member X-Ref	Lists all the Source Lines where the Field/Variable has been used/referenced, in the Source Member and its associated Device Files and Copybooks. This option enables only when <b>Jump to</b> is opted on the Source Browser.
Variable Where Used	Displays all the instances of the specified variable in the application.
Variable Where Updated	Same as Variable Where Used, but displays only those source lines where the field is updated.
Variable Where Defined	Displays the source lines where the variable is defined.
Data Model Diagram	Displays the Data Model Diagram of the object.

# **SOURCE BROWSER VIEW**

The source browser displays the source for an object. The context menu on any member/object has the **Zoom Source** option which invokes the source browser for that object or member.

Context menu – Zoom Source option	Context	menu –	Zoom	Source	option
-----------------------------------	---------	--------	------	--------	--------

指 Object List δ	3							
Object List of *ALLUSR/*ALL/*ALL/*ALL/*ALL, Total Objects: 327							<b>#</b> 1 •	
🐝 • 🖨 🗵 •								
Library	Name Ty	pe Attribut	e   D	escription	Status	Changed	Created	Us 🔼
R [®] XAN4CDEM	CON001 *P	GM RPG	Co	ontract Entry	*D	05/06/12	01/09/08	18,
XAN4CDEM	[월국 Zoom Sourc	ie k		ler Entry Display		05/06/12	01/09/08	18/
XAN4CDEM	(			ntract Entry Display		05/06/12	01/09/08	18)
CLXAN4CDEM	( 🚅 Data Flow (			: Correspondence	*A	05/06/12	01/09/08	18)
PFXAN4CDEM	Object Whe	-	•	pol copybooks	*D	05/06/12	10/05/11	04/
CLXAN4CDEM	(	10 0300		ld Security Fax	*A	05/06/12	01/09/08	18)
CLXAN4CDEM	Variable Wł	nere Used	•	d Code to Batch	*В	05/06/12	01/09/08	18/ 💙
<	- Churchenne C	L P:						>

Select any member/object and double-click on it to open the source member of that object in the X-Analysis source browser.

#### **Zoom Source**

The Source Browser follows the pattern similar to IBM's SEU and is equivalent to viewing a source member in SEU browser mode. However, the X-Analysis source browser provides a number of additional features. It allows you to browse another source, and also continue with another zoom on reaching there. Further, you can traverse to the previous screen from where the zoom was issued.

		So	urce Brows	er View			
指 Object List	🖹 🔍 CON001 🛛 🕅	X					
Source List of C	ON001 in XAN40	DEM/QRI	PGSRC, Lines:	271, View Level: 5			<b>#</b> 1 -
= • 🗈 🛃 🔳	📴 • 👘 • 💵	1 <b>- 29 -</b>	🟪 🖪 📃 i	🛛 • 🖨 🔯 •			
Seq No	*+ 1	1+.	2+	3+	4+	5.	
0019.00	I				244	2.53	00 👝
0020.00	I *						
0021.00	C * * *	*****	* * * * * * * * * *	* * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * *	* * *
0022.00	C* R	eceive	Parameter	18			
0023.00	С		*ENTRY	PLIST			
0024.00	С			PARM	00rtn	1	
0025.00	С*						
0026.00	C* U	ntil F:	3				
0027.00	С		*IN03	DOUEQ'1'			
0028.00	С*						~
<							>

#### Note the following on this view:

- When the Source Browser invokes, then the cursor is positioned to the beginning of C-specifications for RPG/RPGLE programs and Procedure Division for COBOL programs.
- Double-click on the line performs 'Member X-Ref' or 'Object Where Used' depending on whether Object/Variable is available on that line. Preference is given to the Member X-Ref option, in case it is a Program. On Physical/Logical Files, Global Where Used is performed for the field on that line for that file.

#### Use of Templates by the Source Browser

The source browser uses the extension of any ***PGM** file to determine its type, for e.g. the attributes which are equivalent to CBL are: CBLLE, CBLnn (CBL36 & CBL38), CICSCBL, CICSSQLCBL, SQLCBL, SQLCBLLE, and undefined attributes if it is a COBOL Source File.

Information about an object can be displayed by selecting/highlighting the object and performing any of these:

- Opt for the context menu to select an option.
- Double-click to bring up a designated view depending on the current view.

#### Zoom Source toolbar

Zoom Source toolbar comprises various options which are discussed below.

Toolbar available on Source Browser					
Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5					
🗏 • 🖹 🛃 🗮 🕃 • 🗭 • 💵 • 🐏 🖬 🚍 i 🔉 • 🚔 🎕 •					

#### **Source Options**

**Source Options** is the drop-down menu presenting the different source mode views that are available.



	Source Options	
🕹 Object List 🛛 🖹 🤉 COI	N001 🕱 🗖	
Source List of CON001 in	XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5	•
🔲 🍃 🖬 🔚 🖬 🖷 🗧 🗧	🖻 🕶 🖳 💀 🗢 🔚 📮 i 🗔 🕶 🖨 🔯 🕶	
✓ Normal Source Code	. 1+ 2+ 3+ 4+ 5+	^
Indented Source Code	244 253 000	_
Business Rules Overlay		
Business Rules	*******	
Consolidated Rules	· Receive Parameters	
Business Process Logic	*ENTRY PLIST	
0024.00	C PARM 00RTN 1	
0025.00	C*	
0026.00	C* Until F3	~
<		

#### Normal Source Code

The Normal Source Code is the default source view for RPG/COBOL programs.

#### Indented Source Code

Select Indented Source Code from Source Options to display the indented source code:

指 Object List	🖹 🔍 CON001 🛛		- 8
Indented Source	e of CON001 in XA	N4CDEM/QRPG5RC , Lines: 211, View Level: 5	#A •
🗏 🔻 🖹 🖶 🗐	😨 • 🖗 • 🖤 v	• 📴 = 😘 📴 📃 i 🗩 = 🖨 🗞 =	
Seq No	INDENTED SO	URCE CODE	^
0082.00	С*	Delete SFL	
0083.00	С	MOVEL'1'	* IN
0084.00	С	WRITEOESFLC	
0085.00	С	MOVEL'O'	* IN
0087.00	С*	End: So long as Exit not reques	sted #3 💻
0088.00	С	END	
0090.00	C*	End: So long as Exit not requested	#2
0091.00	С	END	
0093.00	C *	End: So long as Exit not requested #1	
0094.00	С	END	
0096.00	C *	End: Until F3	
0097.00	С	END	
0099.00	C* Ter	rminate Program	~
<			>

Indented Source Code

### **Business Rules Overlay**

Select the **Business Rules Overlay** option to observe the business rules embedded in the Normal Source Code. The following screen displays the Business Rules Overlay view for **CON001**.

		Business Rule	es Overlay	window	
🔓 Programs	🖹 🔍 CON001 🔀				
Business Rules O	verlay for CON0	)1QRPGSRC,	Lines: 282, Vi	ew Level: 5	<b>#</b>
🗏 👻 🔝 🖛	🕄 🔻 🚰 🕶 🔛	- 🔄 - 😭 🖬	📃 i 🛛 🗖	r 🖨 🛱 🔻	
Seq No	*+ 1 .	+ 2 .	+ 3	+ 4+	5+ ^
0043.00	с		EXF	MTOESFLC	99
0044.00	C*				
0045.00	C* So	long as Ex	it not re	quested #1	
0046.00	с	*INO	3 IFN	E '1'	
0047.00	C*				
0048.98 1	R00001C* Co	ntract > 3	00000		
0048.00	C* Val	idate Cont.	ract no.		
0049.00	С	DSOR	DN IFG	T 300000	
0050.00	с		MOV	EL'OEMO010' ZMSGID	7
0051.00	С		END	IF	
0052.00	C*				~
<					>
📕 Business Rules	8			Tu Te T 🖨 🗵 🔻	🚺 🗕 📑 🗖
Business Rules for	CON001, Numbe	r of Lines: 11			
Source Member	Rule Number	Field	File	Rule	
CON001	00001	XWORDN	CONDET	Contract > 300000	
CON001	00002	XWORDN	CONHDR	Contract not found on Co	ontract_Header
CON001	00003	XWBCCD	CONHDR	Debtor not found on Purc	:hases
CON001	00004	XWORDN	CONHDR	Contract found on Contra	act_Header
CON001	00005	XWABCD	CONDET	Product <> 0	

#### **Business Rules**

CON001

CON001

CON001

CON001

CON001

CON001

00006

00007

80000

00009

00010

00011

XWABCD

XWABCD

XWABCD

XWABCD

XWAACS

XWABCD

Select the **Business Rules** option to access the business rules for the selected source member. The Business Rules for **CON001** are displayed below.

CONDET

CONDET

CONDET

CONDET

CONDET

CONDET

Product found on Contract_Detail

Product not found on Product_Master

Product not found on Stock_Balances

Product not found on Transaction_History

Store not found on Store_Master

Product <> 0



🕹 Programs	CON001 🛛					
Business Rules fo			GSRC. View Le	evel: 1	<b>#</b>	
🗐 🔻 🗐 🚼 🔫 (						
Business Rule					^	
	ceive Paramet	ers			-	
	til F3					
// In:	itialise scre	en				
// Get	t Contract No	. & Customer	r No.			
// So	long as Exit	Not request	ted #1			
R	00001 Contrac	t > 300000				
11	Validate Cont	tract no.				
1	IF XWORDN > 30	00000				
	ERROR OEM001	10				
END						
	trieve Contra					
// Set	trieve Contra t up blank su		roduct line	3	~	
// Set	t up blank su		roduct line		-	
// Set	t up blank su		roduct line	3 7 <b>0 7€ 7 ⊜ ⊘ → 10 →</b>	-	
// Set	t up blank su	bfile for P	roduct line		-	
Business Rules	t up blank su S CON001, Numbe	bfile for P	roduct line		-	
<ul> <li>// Set</li> <li>Business Rules</li> <li>Business Rules for</li> </ul>	t up blank su S CON001, Numbe	bfile for P: er of Lines: 11		Tu Te T 🖨 🛛 🕶 🔲 🕶	-	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> </ul>	t up blank su S CON001, Numbe Rule Number	bfile for Pr er of Lines: 11 Field	File	Tu Te T ⊜ D → II → I	- - -	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> </ul>	t up blank su S CON001, Numbe Rule Number 00001	bfile for P er of Lines: 11 Field XWORDN	File	Tu         Te         T         Im         ▼           Rule         Contract > 300000         Im	t_Heade	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Numbe Rule Number 00001 00002	er of Lines: 11 Field XWORDN XWORDN	File CONDET CONHDR	TE     T     I     I       Rule       Contract > 300000       Contract not found on Contract	t_Heade	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Numbe Rule Number 00001 00002 00003	er of Lines: 11 Field XWORDN XWORDN XWBCCD	File CONDET CONHDR CONHDR	TE       T       Image: Second secon	t_Heade	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Numbe Rule Number 00001 00002 00003 00004	r of Lines: 11 Field XWORDN XWORDN XWBCCD XWORDN	File CONDET CONHDR CONHDR CONHDR	TE       T       Image: Second secon	t_Heade eader	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Number Rule Number 00001 00002 00003 00004 00005	er of Lines: 11 Field XWORDN XWORDN XWBCCD XWORDN XWABCD	File CONDET CONHDR CONHDR CONHDR CONDET	TE       T       Image: Image	t_Heade s eader	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Number 00001 00002 00003 00004 00005 00006	er of Lines: 11 Field XWORDN XWORDN XWBCCD XWORDN XWABCD XWABCD	File CONDET CONHDR CONHDR CONHDR CONDET CONDET	TE       T       Im       Im         Rule       Contract > 300000       Contract not found on Contract         Debtor not found on Purchases       Contract found on Contract_He         Product <> 0       Product found on Contract_De	tail	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> <li>CON001</li> </ul>	t up blank su CON001, Number 00001 00002 00003 00004 00005 00006 00007	r of Lines: 11 Field XWORDN XWORDN XWBCD XWORDN XWABCD XWABCD XWABCD	File CONDET CONHDR CONHDR CONHDR CONDET CONDET CONDET	TE       T       Im       Im       Im         Rule       Contract > 300000       Contract not found on Contract         Debtor not found on Purchases       Contract found on Contract_He         Product <> 0       Product found on Contract_De         Product <> 0       Product <> 0	t_Header tail	
<ul> <li>V/ Set</li> <li>Business Rules</li> <li>Business Rules for</li> <li>Source Member</li> <li>CON001</li> </ul>	t up blank su CON001, Number Rule Number 00001 00002 00003 00004 00005 00006 00007 00008	er of Lines: 11 Field XWORDN XWORDN XWBCCD XWORDN XWABCD XWABCD XWABCD XWABCD	File CONDET CONHDR CONHDR CONHDR CONDET CONDET CONDET CONDET	TE       T       Im       Im <th< td=""><td>t_Heade eader tail Master alances</td></th<>	t_Heade eader tail Master alances	

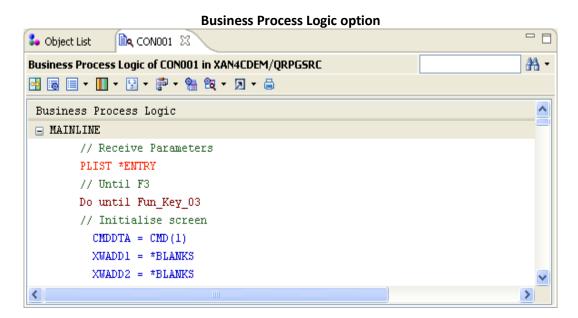
#### **Consolidated Rules**

Select the **Consolidated Rules** option to display the file-field based business logic for the selected source member. The Consolidated Rules for **CON001** are displayed below:

	Consolidated Rules	
🕹 Object List	CON001 X	- 8
Consolidated Ru	les for CON001	A -
🗏 • 📈 🖗 • 🛛	l" + % 📴 🖳 🛪 + 🖨 🔯 +	
Program	Rule	
E CONOO1		
重 R0001	Contract > 300000	
⊞ R0002	Contract not found on Contract_Header	
⊞ R0003	Debtor not found on Purchases	
⊞ R0004	Contract found on Contract_Header	
⊞ R0005	Product found on Contract_Detail	
R0006	Product <> 0	
<		>

#### **Business Process Logic**

Select the **Business Process Logic** option to access the process logic for the selected source member. The Business Process Logic for **CON001** is shown below.



#### **Source Outline**

Select the **Source Outline** option to view all subroutines/modules and called programs available in the source code.

The cursor is positioned to a particular line of code in the source browser when any of the listed items is double-clicked from the Source Outline view.



			Source	Outlin	е				
指 Object List	🖹 🔍 CON001 🖇	X						🚺 Source Outline	x - D
Source List of C	DN001 in X Lir	nes: 271, Viev	v Level: 5			AA •	-	CON001	
🗉 • 🖬 🖶 🖪	😨 + 🚰 + 🛙	2 - 📴 - 鵅	🖬 📃 i	🛛 • 🖨	🔁 🕶			\$RVCON	
Seq No	*+	1+	2+.	3	.+	4 🔥	J	\$PRLNS \$VALID	
0053.00	С*	Retrieve	Contract	; Detai	ls			\$CRCON	
0054.00	С			►EXSR	\$RVCON	-		•	
0055.00	С*								
0056.00	С*	Set up bi	lank subf	ile fo	r Prod	luct			
0057.00	C			EXSR	\$PRLNS	;			
0058.00	С*								
0059.00	С*	Display (	Contract	Entry	screen	1			
0060.00	C			MOVEL	11	~			
<		)				>			

#### Show Split Panel

The **Show Split Panel** option helps you compare the Normal Source Code with its Business Process Logic code. It promotes better understanding of the Business Process Logic code.

**Show Split Panel option** 

Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5	-
🗏 - 🖹 🔄 🗐 - 😰 - 🖤 - 🖤 - 🔚 🖬 📮 i 🛛 - 🖨 🎕 -	
Seq No 🕅 * + . 1+ 2+ 3+ 4+ 5+. 0022.00 Show Split Panel * Receive Parameters	
0022.00 Show Split Panel Receive Parameters	

Select the **Show Split Panel** option to display a split panel displaying the Normal Source and the Business Process Logic code, simultaneously:

	Norma	Source Code and	a Bus	siness Process Logic code	
🍰 Object List	De CONODI	X			
		DEM/QRPGSRC, Line			•
		: • 📴 • 😤 🛄 🕒			
	+ 2+	3+ 4	. ^	Business Process Logic	^
C *				// Get Contract Details	
C* Get Co C C C C C C C C C C C C C C C C C C	ntract Deta DSORDN *IN40	ils (if existin CHAINCONHDRR IFEQ '1' MOVEL*BLANKS MOVEL*BLANKS MOVEL*BLANKS MOVEL*BLANKS MOVEL*BLANKS ENDIF	ng	Read data CONHDRR using *IN40 = Not Found If Not *IN40 *IN40 = %ERROR End If *IN40 XWADD1 = *BLANKS XWADD2 = *BLANKS	
C* Get Cu	stomer Deta	ils		XWADD3 = *BLANKS	
с	DSCSNO	CHAINCUSTS		XWPCDE = *BLANKS	
с	* IN82	IFEQ '1'	×	End	Y
<			>	< >	

### Normal Source Code and Business Process Logic code

When you double-click on a particular line in the Normal/Original Source code, its corresponding source line on the Business Process Logic code gets highlighted. The **Show Split Panel** button has toggle behavior and clicking it reverts to the Normal Source Code view.

#### Pseudo Code

**Pseudo Code** is also a toggle option for viewing the Pseudo Code for the Normal Source Code.

Pseudo Code toggle button														
Source List of C	ON001 i	in XAN4	CDEM	/QRP	GSRC,	Lines	: 271	, Yiew	Level: 5				(	<del>71</del> -
🔲 - 🗈 🛃 📮	12 3 -	🖗 - L	M - 8	<u>b</u> • (	h 🖬		i 🗵	- 🖨	2					
Seq No 🛉	Č *	+	1	.+	. 2		·	з.	+	4	+	5	+	<u>^</u>
0021.00	Pseudo	code *	* * * * '	* * * *	****	* * * *	***	* * * *	* * * * * *	* * * *	* * * * * * * *	* * * *	****	<b>*</b> 1

Click the icon to display the Pseudo Code for **CON001.** 

	Pseudo Code for CON001	
指 Object List	Be CONDO1 X	
Source List o	f CON001 in XAN4CDEM/QRPGSRC, Lines: 194, View Level: 5	#A -
🗏 • 🗈 🛃	🔲 💱 + 🗊 + 💵 + 🐏 🖬 i 🗩 + 🚔 🔯 +	
Seq No	Pseudo Code	<u>^</u>
0021.00	/ * * * * * * * * * * * * * * * * * * *	****
0022.00	/** Receive Parameters	
0023.00	PARAMETER LIST : *ENTRY	
0024.00	00RTN (1) /*Return Code	
0026.00	/** Until F3	
0027.00	Repeat Until Command Three equal to '1'	
0029.00	/** Initialise screen	
0030.00	Move Array CMD,1 to CMDDTA	
0031.00	Move Left *BLANKS to CONO01DF.Address	
0032.00	Move Left *BLANKS to CONO01DF.Address 2	~
<		>

You can switch back to the Original Code through the toggle action of the button.

	Pseudo Code loggie bullon	
指 Object List		- 8
Source List o	of CON001 in XAN4CDEM/QRPG5RC, Lines: 194, Yiew Level: 5	<b>#</b> 1 -
🗏 • 🗈 🖶	🔲 🗄 • 👘 • Щ • 🎥 • 🐜 📓 i 🔎 • 🖨 🔯 •	
Seq No	Reudo Code	^
0021.00	Original Code ************************************	** 💛
0022.00	/** Receive Parameters	
0023.00	PARAMETER LIST : *ENTRY	
0024.00	00RTN (1) /*Return Code	~
<		>

#### Pseudo Code toggle button

#### Source Level

Source Levels 1-5 are available on Program objects only. The Source Level menu on this display allows for indentation and five levels of source listing. Each level suppresses certain source lines.

Source Level options							
指 Object List	Be CON001 X						
Source List of CO	DN001 in XAN4CDEM/QRPGSRC, Lines: 271, Vie	w Level: 5		<b>#</b> -			
🔲 🕶 🗈 🖪	💱 • 🖗 • 🖤 • 💩 • % 🖬 📃 i 🗵 • (	🗟 😫 🔹					
Seq No	Comments Only/Screen Reads (Comment)	.+	4+	5+🔼			
0204.00	View Level 1 (Call Operation)						
0205.00	View Level 2 (File Operation)						
0206.00	View Level 3 (Program Structure Operation)						
0207.00	View Level 4 (Field Operation)						
0208.00	✓ ■View Level 5 (Commented Out & Excluded)	11	*IN35	_			
0209.00	View Level 6 (Blocked Comments)	1	0RRN1				
0210.00	С*	_		~			
<				>			

The current source level is shown on the title bar.

#### **Diagram Options**

Choose different diagram options:

- 1. Data Flow Diagram: Generates Data Flow Diagram for the Object.
- 2. **Hierarchical Structure Chart**: Generates Hierarchical Structure Chart diagram for the Object.
- 3. Structure Chart Diagram: Generates Structure Chart Diagram for the Object.
- 4. Screen Flow Diagram: Generates Screen Flow Diagram for the Object.
- 5. **Program Structure Chart**: Generates Program Structure Chart for the Object.

Diagram Options								
🕹 Object List 🛛 🗎 🔍 🤇	CON001 🛛							
	in XAN4CDEM/QRPGSRC, Line			<b>#1</b> •				
🗏 • 🗈 🖶 🖪 •	🖻 🔪 🖷 🖷 🖻 🕈	i 🛛 🕶 🖨 🔁 🕶						
Seq No *	🚏 Data Flow Diagram	. 3+	4+ 5	5+ <mark>^</mark>				
0204.00	🚠 Hierarchical Structure Chart	BEGSR						
0205.00	🍹 Structure Chart Diagram							
0206.00	E Screen Flow Diagram			_				
0207.00	Program Structure Chart							
0208.00		MOVEL'1'	* IN35					
<u> </u>				2				

#### **Generate UML**

Choose different UML diagram options:

- 1. Class Diagram: Generates Class Diagram for the Object.
- 2. Activity Diagram: Generates Activity Diagram for the Object.

Generate UML options								
Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5								
🗉 - 🗈 🛃 🗐	🕄 <b>-</b> 🗗 -	ur 📐 📴 🔻 🐏 🖪 📃 🛛	i 🗵 • 🖨 🛱 •					
Seq No	*+	🖫 Class Diagram	3+	4+	5+🛆			
0204.00	C	🎽 Activity Diagram	BEGSR					
0205.00	C*L				-			
0206.00	С*	Validate Contrac	st		~			
<					>			

#### Flowchart

It is a drop-down menu, and contains two options:

- 1. Flowchart: Generates Flowchart for the Program.
- 2. Flowchart for current Subroutine/Procedure: Generates Flowchart for the selected Subroutine/Procedure of the Program.

Flowchart options						
Source List of CO	NOO1 in XAN4CDE	M/QRPGSRC, Lines: 271, View Level: 5	AA -			
		📴 💦 🖀 🖬 📮 i 🗵 • 🖨 😫 •				
Seq No	*+ 1	· 🔄 Flowchart	5+🔨			
0204.00	С	😰 Flowchart for current Subroutine/Procedure				
0205.00	С*					
0206.00	C* Val	idate Contract	*			
<			>			

Click the **Flowchart** icon to generate a flowchart using Microsoft Visio.

#### **Screen Components**

Select the **Screen Components** option to display a list of all available screen components for the selected program.

Screen Components option							
Source List of (	CON001 in XAN4CDE	M/QRPGSRC, Lines: 2	71, View Level: 5		AA -		
🗉 • 🗈 🛃 🛛	🛛 😳 🕶 👘 🕶 💵 🕶	🛃 - 😭 🖬 📃 i	🗵 • 🖨 🔯 •				
Seq No	*+ 1 .	· · + · · · Screen Comp	onents · · · + · · ·	4+ 5	+🔼		
0204.00	С	\$VALID	BEGSR		~		
<					>		

#### Screen/Report Design

The Screen/Report Design displays the layout for associated DSPF/PRTF.

Screen/Report Design option							
Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5	<i>a</i> na -						
🗏 • 🖹 🚰 🔚 • 🗭 • 💵 • 🕾 🖬 📮 i 🗵 • 🚔 🎕 •							
Seq No *+ 1+ 2 3	5+🔼						
0021.00 C***********************************	*****						

#### Lpex/SEU Editor

#### SEU

You can make changes to the source code using the **SEU** option. Click the **SEU** icon available on the Source Browser toolbar.

Invoke SEU option from the Source Browser							
Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5							
🗏 • 🖹 🛃 🗐 • 🖗 • 💵 • 🐏 🖷 🖳 i 🗔 • 🖨 🎕 •							
Seq No *+ 1+ 2	+ 🔨						
0021.00 C***********************************	*						

#### Lpex Editor

You can make changes to the source code using the **Zoom in Lpex** option. Click the **Zoom in Lpex** icon available on the Source Browser toolbar to initiate the Lpex editor.

Zoom in Lpex is a default option for all IBM Rational products having an RSE plugin. For all other Eclipse products, SEU (5250 Emulator) is the default option. You can change the default settings using the X-Analysis 'General Preferences' option. Invoking 5250 session requires XAN4SEU user on the IBM i. Refer to <u>Appendix B</u> for creating XAN4SEU user.

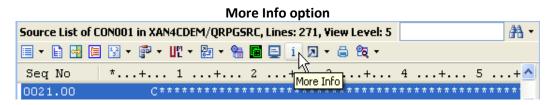
The X-Analysis Plugin comes with default Preferences settings. To change the Preferences settings, start IBM's RDi/RDp/WDSC (7.5 and above) or Eclipse 3.4 (and above), then select **Window > Preferences** to display the **Preferences** window.

Default View Level 1 🔽
Object Where Used Entry Level References 7
Default Source Editor
O Lpex 💿 5250 Emulator
Others Number of records to display 1000
Restore Defaults Apply
OK Cancel

#### **General X-Analysis Preferences setting for Source Editor**

#### More Info

The **More Info** option presents detailed information about an object. Select the option from the source browser toolbar or the right-click menu over a selected object from the Object List.



Important information related to the status, function, attribute etc. of an object are displayed, besides other relevant details like the number of Business Rules or the Complexity figures.

The screenshot underneath shows the More Info dashboard for the object, CNTCMAINT.



🍫 Object List 🛛							🚦 N	Nore Info Dashboard	3 - 1
Object List of *AL	LUSR/*ALL/*ALL/*AL	L/*ALL/*ALL, To	otal Objects:	362		#A •	More	Info for CNTCMAINT	
🙀 = 🖨 🗵 =								General	
Library	Name	Туре	Attribute	Descrip	tion	^		Name	CNTCMAINT
· · · ·		~				_		Description	Contacts Maintenanc
Z XAN4CDEM	BALANCESTO	*QMFORM	QUERY		e by Store	_		Library	XAN4CDEM
XAN4CDEM	CBCUSTSD	*FILE	DSPF	Work v	vith Customers	_		Туре	*PGM
CL XAN4CDEM	CBC110	*PGM	CLP	Order I	Entry System	_		Attribute	RPGLE
R ^P GXAN4CDEM	CB906R	*PGM	RPG	Back-o	ut account			Function	EDTRCD
XAN4CDEM	CB906RD	*FILE	DSPF	Order B	Entry display file			Status	*A
CL XAN4CDEM	CLET	*PGM	CLP	Build C	ustomer Letter			Creation Date	13/09/10
CL XAN4CDEM	CLETN	*PGM	CLP	Print C	ustomer Letter			Creation Time	13:14:09
■ XAN4CDEM	CL03	*PGM	CLLE	for rea	d source file			Last Used	22/09/14
PF XAN4CDEM	CNTACS	*FILE	PF	Contac	ts			Days Used	24
RF XAN4CDEM	CNTCMAINT	*PGM	RPGLE	Contac	ts Maintenance			Physical File	CNTACS
Z XAN4CDEM	CNTCMAINTD	*FILE	DSPF	Contac	ts Maintenance			Business Rule	
LF XAN4CDEM	CNTLF1	*FILE	LF	Global	Contacts by Salesman			BR Count	8
LF XAN4CDEM	CNTLF2	*FILE	LF		Contacts by Name	_		Annot. Count	0
LF XAN4CDEM	CNTLF3	*FILE	LF		Contacts by Status	- 1		Complexity	
LF XAN4CDEM	CNTLF4	*FILE	LF		Contacts by Prod & Sta			Source Lines	266
PF XAN4CDEM	CONDET	*FILE	PF		ct Detail	us		Cyc. Complex.	23
						- 1		Halstead	1240
LFXAN4CDEM	CONDETL1	*FILE	LF		e/Contract/Product	- 1		Maint.Index	178
LFXAN4CDEM	CONDETL2	*FILE	LF		e/Contract/Product	_		Files	3
LFXAN4CDEM	CONDETL3	*FILE	LF		duct/Contract	_		Device Files	1
PFXAN4CDEM	CONDETNW	*FILE	PF	Contra	ct Detail new -?CBL Ver	. wir 🖉		Called Programs	1
0 VANIAGDELA	CONUDA	*FU F	DC	10 M	600 B	>		Calling Programs	0

More Info window for a Program – CNTCMAINT

However, for objects with PF attribute, the **More Info** display is limited to the General and the Complexity details. The image below shows More Info (without the Business Rules count) for the PF object, **CONDET**:

🎝 Object List 🛛						😫 More Info Dashboard	x " E
Object List of *ALI	USR/*ALL/*ALL/*AL	L/*ALL/*ALL	Total Objects:	362	<b>#</b> •	More Info for CONDET	
🙀 🕶 🖨 🗩 🔻						General	
Library	Name	Туре	Attribute	Description	^	Name	CONDET
,						Description	Contract Detail
PF XAN4CDEM	CNTACS	*FILE	PF	Contacts		Library	XAN4CDEM
RE XAN4CDEM	CNTCMAINT	*PGM	RPGLE	Contacts Maintenance		Туре	*FILE
XAN4CDEM	CNTCMAINTD	*FILE	DSPF	Contacts Maintenance		Attribute	PF
LF XAN4CDEM	CNTLF1	*FILE	LF	Global Contacts by Salesman		Function	
LF XAN4CDEM	CNTLF2	*FILE	LF	Global Contacts by Name		Status	*В
LF XAN4CDEM	CNTLF3	*FILE	LF	Global Contacts by Status		Creation Date	01/09/08
LF XAN4CDEM	CNTLF4	*FILE	LF	Global Contacts by Prod & Sta	atus	Creation Time	15:27:40
PF XAN4CDEM	CONDET	*FILE	PF	Contract Detail		Last Used	25/09/14
LF XAN4CDEM	CONDETL1	*FILE	LF	by Store/Contract/Product		Days Used	81
LF XAN4CDEM	CONDETL2	*FILE	LF	by Store/Contract/Product		Complexity	
LF XAN4CDEM	CONDETL3	*FILE	LF	by Product/Contract		Fields	8
PF XAN4CDEM	CONDETNW	*FILE	PF	Contract Detail new -?CBL Ver	. wir	Access Paths	4
PF XAN4CDEM	CONHDR	*FILE	PF	Contract Header		Creating Pgms	0
LF XAN4CDEM	CONHDRL1	*FILE	LF	by Debtor/Contract		Reading Pgms	5
LF XAN4CDEM	CONHDRL1A	*FILE	LF			Updating Pgms	10
				by Debtor/Cust Ref	- U	Deleting Pgms	2
LFXAN4CDFM <	CONHDRI 2	*FII F	IF	by Rep/Contract	>	Total References	17

#### More Info window for a File – CONDET

#### **Export Options**

It is a drop-down menu, and contains options for exporting list, adding annotates and generating system document.

- 1. Export to PDF/MS Word: Exports current list on the X-Analysis Client to PDF/MS Word.
- 2. Export to MS Excel: Exports current list on the X-Analysis Client to MS Excel.
- 3. Annotate: Allows to add annotates for the selected object.
- 4. **Documenter**: Allows to access the **Documenter** option for generating a customized system document.

	Export Options								
Source List of C	ON001 in XAN4CDEM/QRI	PGSRC, Lines: 2	271, View Level: 5	# <del>1</del> -					
- 🖬 🖪 🖪	📴 • 🚏 • 💵 • 📴 •	🖀 🖪 📃 i	🗵 🔨 🖨 🗖						
Seq No	*+ 1+.	2+.	Export to PDF	5+🔼					
0021.00	C * * * * * * * * * *	* * * * * * * * * * *	🛓 Export to MS Excel	; * * * * * * * * * *					
0022.00	C* Receive	Parameters	Annotate						
0023.00	C	*ENTRY	2 Documenter						
0024.00	C			TN 1 💌					
<				>					

#### Print

The **Print** option directly prints the currently displayed source content.

	Print option								
Source List o	f CON001 in XAN4CDEM	<b>辞</b> -							
🗉 • 🗈 🛃	🧧 🚼 🕶 👘 🕶 ኵ 🕶	题 • % 📓 🚍 i 🛛 • 🖨 🔯 •							
Seq No	*+ 1	+ 2+ 3 <u></u>	4+ 5+🔼						
0013.00	E *	Print	-						

#### View Code

Select the **View Code** option to view the reengineered, the restructured, or the generated code of a selected object.

	View Code option							
Source List o	Source List of CON001 in XAN4CDEM/QRPGSRC, Lines: 271, View Level: 5 🛛 🕮 🛪							
🗉 • 🗈 🖶	🗐 🐨 🖷 🕶 🔛	- 📴 - 🐏 📓 📮 i 🗵 - 🚔 🎨 -						
Seq No	*+ 1	+ 2+ 3¥ 4+ View Code	5+🛆					
0013.00	Ε×	View Code						

# **OBJECT WHERE USED**

The **Object Where Used** option lists all the instances in the application where a specified object has been used/referenced. The following are the details of the sub-options of **Object Where Used**.

- **Usage References:** List of objects which are using this object.
- **All References:** List of objects where this object is being used. Besides this, source references for which the objects do not exist are also displayed.
- **Update References:** List of objects which are updating this object.
- Delete References: List of objects which are performing delete operation on the specified object.
- **Entry Level References:** Entry level references in 'Object Where Used' list all entry level programs (*A), which directly or indirectly access the object in question.
- Real Time References: Object Where Used references to track dependencies. It facilitates the live impact analysis at runtime, and lets you see the "Real Time" references or the object dependencies.

Select **CUSF** from the Member/Object List, and choose the **Object Where Used** option from the context menu.

指 Object List 🛛							
Object List of *AL	LUSR/*ALL/*A	LL/*AI	LL/*ALL/*ALL,	Total Objects:	362	AA AA	Ŧ
🐝 = 🖨 🗵 =							
Library	Name		Туре	Attribute	Descript	tion	^
CL XAN4CDEM	CSEC		*PGM	CLP	Build Se	ecurity Fax	
CL XAN4CDEM	CSEC2		*PGM	CLP	Add Co	de to Batch	
CL XAN4CDEM	CSEC3		*PGM	CLP	Agent F	ax Prompt	
R ^P _G XAN4CDEM	CUSCPY		*PGM	RPG	Custom	ner Copy	
PF XAN4CDEM	CUSF		****	DE	e1		
LF XAN4CDEM	CUSFLA	۵	Zoom Sourc	ce		Product - renamed from cusfla for te	
LF XAN4CDEM	CUSFLB	<b>P</b>	Data Flow D	iagram		Drig.List	
LFXAN4CDEM	CUSFLC		Object Whe	re Used	•	Usage References	٦
LFXAN4CDEM	CUSFLD		,			All References	
LFXAN4CDEM	CUSFLE		Variable Wh	ere Used	•		
LFXAN4CDEM	CUSFL1	~	Data Model	Diagram		Update References	
LFXAN4CDEM	CUSFL2		File Field De	-		Delete References	
LF XAN4CDEM	CUSFL3					Entry Level References	
LF XAN4CDEM	CUSFL5		LFs/Access	Paths		Real Time References	
LF XAN4CDEM	CUSFL6		Access Path	Diagram	l	Jist.& Name	4
<			Consolidate	d Rules		>	

#### **Object Where Used option**

This produces an Object Where Used listing for all objects referring to CUSF.

If you select the Object Where Used on a PF (CUSF, in this case), then besides listing the objects using **CUSF**, the objects using the LFs built on CUSF (e.g. CUSFL3) are also reported.

指 Object List	👬 Object V	Where Used 🛛	- 8
Object Where U	lsed - Usage	References for CUSF, Total Objects: 77	🖨 🗷 •
Object	Туре	Text	Usage 🔥
CB906R	*PGM	Back-out account	File Updated By Program 📃
CONUPDO	*PGM	Revert Back Customer Info	File Updated By Program
CONUPD1	*PGM	Update Customer Info - Version 1	File Updated By Program
CONUPD2	*PGM	Update Customer Info - Version 2	File Updated By Program
CUSCPY	*PGM	Customer Copy	File Read/Written To By Program
CUSFL1	*FILE	Sites by Name	Logical File
CUSFL2	*FILE	Sites by Status	Logical File
CUSFL3	*FILE	Sites by Number	Logical File
CUSFL5	*FILE	Sites by Dist.& Status	Logical File
CUSFL6	*FILE	Sites By Dist.& Name	Logical File
CUSFL7	*FILE	Sites by Last Cnt.Date	Logical File
CUSFL8	*FILE	Sites by Next Cnt.Date	Logical File 💌
<			>

If you select the Object Where Used on a variable in a ***PGM** type object, then all objects where the variable has been used are listed.

Select an object and click **ENTER** to access its Source List. Alternatively, double-click on that object row. Double-click on an object from the Object Where Used list to zoom on to the source line where the first reference has been made.

# VARIABLE WHERE USED

The **Variable Where Used** option lists all source lines from the application, where the field/variable of a file/program is used/referenced in any of the source members and its associated device files and copybooks.

A wide variety of options can be specified including:

Files, Array Definitions, Data Structures, Sub-Fields Data Structures, Indicators, Key Lists, Data Fields, File Formats, Subroutines, Program Variable, Array Elements, Parameter Lists, Parameters, Key Fields, Message Ids, EXCPT Names, etc.

The Variable Where Used submenu provides the following options:

All References: All references of this variable.

**Update References:** References where this variable is being updated.

**File References:** All references where the object using this variable is a file.

- **Definitions Only:** Lists references where this variable was defined.
- Summary References: This option on a variable or File/Field, lists all objects that use the selected variable or File/Field and also the usages for the same. The result is displayed in Object Where Used.
- Rule Variable References: Lists all Business Rules based on the selected object from across the entire application.

Select the Variable Where Used option for the CUSNO field using the JumpTo dialog.

🚜 Variable Wh	nere Used 🐹	🔒 🛛 • 📄 🚼 • 🛄 • 🖓 🖬
ariable Where	Used for *AL	L/CUSNO, Lines: 184, View Level: Level1
Name	Seq No	*+ 1+ 2+ 3+ 4+ 5+ 6+
CBCUSTSD	0270.00	A ZCUSNO R B 19 22REFFLD(CUSNO XAN4CDEM/CUSTS)
CBCUSTSD	0383.00	A ZCUSNO R 0 19 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CLET	0004.00	DCL VAR(«CUSNO) TYPE(*DEC) LEN(5 0)
CLET	0009.00	CHGVAR &CUSNO &CUSNC
CLET	0010.00	CALL LETN1 («CUSNO «PREFIX «LETSQ)
CLETN	0001.00	PGM PARM(&CUSNO &PREFIX &LLETSQ)
CLETN	0003.00	DCL VAR(«CUSNO) TYPE(*DEC) LEN(5 0)
CLETN	0010.00	CALL LETN1 (&CUSNO &PREFIX &LLETSQ)
CNTACS	0003.00	A CUSNO 5P 0 TEXT('Cus. No.')
CNTACS	0021.00	A K CUSNO
CNTCMAINT	0101.00	C eval zcusno = cusno
<		

#### Variable Where Used view for CUSNO

## Legend

- Dark Red depicts the Definition Statements
- Black depicts the File Operations
- Magenta depicts the Parameters
- Dark Brown depicts the Program Structure Operation
- Dark Blue depicts the Field Operation



#### Legend for Variable Where Used

		U			
👬 Variable W	here Used 🔀			🖨 🛛 🕶 💌 😻 🔂	<u>. 🛯 P </u> _
Variable Where	Used for *AL	L/CUSNO, Lines: 184, View Level:	Level1	Definition Statements	
Name	Seq No	*+ 1+ 2 .	+	File Operations	6 🔼
CBCUSTSD	0270.00	A ZCUSNO	R	_ · · · · · · · · · · · · · · · · · · ·	CDEM/CU
CBCUSTSD	0383.00	A ZCUSNO	R	Parameters	CDEM/CU
CLET	0004.00	DCL VAR(@CUSNO)	TYPE (	Program Structure Operation	
CLET	0009.00	CHGVAR &CUSNO &CUSNC			-
CLET	0010.00	CALL LETN1 (&CUSNO &PR	EFIX ¢	Field Operation	
CLETN	0001.00	PGM PARM(&CUSNO	& PREF	IX «LLETSU)	-
CLETN	0003.00	DCL VAR(&CUSNO)	TYPE (	*DEC) LEN(5 0)	
CLETN	0010.00	CALL LETN1 (&CUSNO &PR	EFIX @	LLETSQ)	*
<					>

#### **View Levels**

The Variable Where Used view is available up to six view levels and the Default View Level icon located on the toolbar allows access to these levels.

		E	xpanded Vie	w Le	vel Menu	
👪 Variable W	here Used 🔀				🖨 🗵 - 🕨 😫	😼 🔨 🔲 🕶 🗖
Variable Where	Used for *AL	L/CUSNO, Lines:	184, View Level:	Level1	✔ Level1	45
Name	Seq No	*+ l	+ 2 .	+.	Level2	+ 6
CBCUSTSD	0270.00	A	ZCUSNO	R	Level3	XAN4CDEM/CU
CBCUSTSD	0383.00	A	ZCUSNO	R	Lv4/Parameters	XAN4CDEM/CU
CLET	0004.00	DCL	VAR(@CUSNO)	TYPE	Lv5/Cascading Parameters	
CLET	0009.00	CHGVAR &C	USNO &CUSNC		Maximum Tracking	
CLET	0010.00	CALL LETN1	(&CUSNO &PR	EFIX	«LETSQ)	
CLETN	0001.00	PGM	PARM ( & CUSNO	6 PRE	FIX «LLETSQ)	~
<						>

Higher Variable Where Used levels can be requested using VWU Levels. The Variable Where Used levels display the following information:

**Level 1:** Direct references to the field.

🚜 Variable Wher	re Used 🛛	a 🛛 🕶 🔜 🖬 🖬 🕶 🗖 🗖
'ariable Where Us	ed for *ALL/CUSNO	), Lines: 184, View Level: Level1
Name	Seq No	*+ 1+ 2+ 3+ 4+ 5+ 6+
CBCUSTSD	0270.00	A ZCUSNO R B 19 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CBCUSTSD	0383.00	A ZCUSNO R O 19 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CLET	0004.00	DCL VAR(«CUSNO) TYPE(*DEC) LEN(5 0)
CLET	0009.00	CHGVAR &CUSNO &CUSNC
CLET	0010.00	CALL LETN1 (&CUSNO &PREFIX &LETSQ)
CLETN	0001.00	PGM PARM(&CUSNO &PREFIX &LLETSQ)
CLETN	0003.00	DCL VAR(«CUSNO) TYPE(*DEC) LEN(5 0)
CLETN	0010.00	CALL LETN1 («CUSNO «PREFIX «LLETSQ)
CNTACS	0003.00	A CUSNO 5P O TEXT('Cus. No.')
<		

#### Variable Where Used Level 1 View

Level 2: Level 2 adds indirect references.

Variable	Where	Used	Level	2 View
----------	-------	------	-------	--------

🛃 Variable W	here Used 🔀	🗎 🗩 • 🔜 🕄 • 🛄 • 🖓 🖬 • 🗍
Variable Where	Used for *ALL/	CUSNO, Lines: 318, View Level: Level2
Name	Seq No	*+ 1+ 2+ 3+ 4+ 5+ 6+ 🔨
CBCUSTSD	0270.00	A ZCUSNO R B 19 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CBCUSTSD	0383.00	A ZCUSNO R 0 19 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CLET	0004.00	DCL VAR(&CUSNO) TYPE(*DEC) LEN(5 0)
CLET	0005.00	DCL VAR(&CUSNC) TYPE(*CHAR) LEN(5)
CLET	0008.00	CHGVAR &CUSNC &PK
CLET	0009.00	CHGVAR &CUSNO &CUSNC
CLET	0010.00	CALL LETN1 (&CUSNO &PREFIX &LETSQ)
CLET	0011.00	CHGVAR &CUSNC &PREFIX
CLET	0014.00	CALL WKCUSL («CUSNC PREFIX «LETNR)
<		

**Level 3:** Level 3 adds further indirection/references to the field in level 2 referencing the first field.

		vai	Table when	e Used Le	eve	15	viev	v					
🕌 Variable W	here Used 🛛	3						۲	🛛 🔹 🕨	😻 🗄	-	<b>II</b> • ⁻	Ľ
'ariable Where	Used for *AL	L/CUSNO, Lines:	394, View Level	: Level3									
Name	Seq No	*+	1+ 2	+ 3		+	. 4	+	5	+	6	+.	. ^
CBCUSTSD	0092.00	A	SFIELD	10A	H								F
CBCUSTSD	0202.00	A	SFIELD	10A	Н								
CBCUSTSD	0270.00	A	ZCUSNO	R	В	19	22RE	FFLD	(CUSNO	XAN4C	DEM,	CUSTS;	
CBCUSTSD	0383.00	A	ZCUSNO	R	0	19	22RE	FFLD	(CUSNO	XAN4C	DEM,	CUSTS;	
CLET	0001.00	PGM	PARM(&PK)										
CLET	0002.00	DCL	VAR(@PK) T	YPE (*CHAR)	LE	N ( 5	00)						
CLET	0004.00	DCL	VAR ( & CUSNO	) TYPE (*DE	C)	LEN	(5 0	)					
CLET	0005.00	DCL	VAR (&CUSNC	) TYPE (*CH	AR)	LE	N(5)						
CLET	0006.00	DCL	VAR(&prefi	x) TYPE(*C	HAR	) L	EN(5	)					١
<												>	

Variable Where Used Level 3 View

**Level 4/Parameters:** Level 4 further includes fields used as parameters.

Variable Where Used Level 4 / Parameters View
-----------------------------------------------

	here Used 🔀		: 483, View Level:	Lud/Decomotor		🖨 🛛 • 🕅 🚼 • 🔟 • 🖓
anable where						
Name	Seq No	*+	1+ 2	+ 3	+.	4+ 5+ 6+
CBCUSTSD	0023.00	A	XWBCCD	11A	0 10	0 5TEXT('Customer')
CBCUSTSD	0092.00	A	SFIELD	10A	H	
CBCUSTSD	0132.00	A	ZWBNCD	2 <b>A</b>	B 12	2 22
CBCUSTSD	0136.00	A	ZPERSON	3A	B 13	3 22
CBCUSTSD	0142.00	A	ZDSDCDE	2 <b>A</b>	B 14	4 22
CBCUSTSD	0202.00	A	SFIELD	10A	Н	
CBCUSTSD	0270.00	A	ZCUSNO	R	B 19	9 22REFFLD(CUSNO XAN4CDEM/CUSTS)
CBCUSTSD	0383.00	A	ZCUSNO	R	0 19	9 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CLET	0001.00	PGM	PARM («PK)			
(						>

Level 5/Cascading Parameters: Extending the information in Level 4, Level 5 includes references where CUSNO fields are parameters in a function, called by another function.

	t an la					
🕌 Variable Wh	nere Used 🛛					🖨 🛛 🕶 🔛 🐯 🐨 🔲 🕶 🗖
Variable Where	Used for *ALL	/CUSNO, <mark>Lines: 80</mark>	4, View Level:	: Lv5/Cascadin	g Para	ameters
Name	Seq No	*+ 1	+ 2	+ 3	+	+ 4+ 5+ 6+
CBCUSTSD	0023.00	A	XWBCCD	11A	0 1	.0 5TEXT('Customer')
CBCUSTSD	0092.00	A	SFIELD	10A	Н	
CBCUSTSD	0105.00	A	ZWBCCD	11A	В	5 22
CBCUSTSD	0132.00	A	ZWBNCD	2A	B 13	.2 22
CBCUSTSD	0136.00	A	ZPERSON	3A	B 13	.3 22
CBCUSTSD	0142.00	A	ZDSDCDE	2A	B 1	4 22
CBCUSTSD	0202.00	A	SFIELD	10A	Н	
CBCUSTSD	0270.00	A	ZCUSNO	R	B 1	9 22REFFLD (CUSNO XAN4CDEM/CUSTS)
CBCUSTSD	0383.00	A	ZCUSNO	R	0.1	.9 22REFFLD(CUSNO XAN4CDEM/CUSTS) 🚩
<						

Variable Where Used Level 5	/ Cascading Parameters View
	/ Cascauling Farameters view

Maximum Tracking: Tracks the usage of a variable or field to maximum level of indirection.

	here Used 🔀		809, View Level: Maxi	num Tracki	ina		🖨 🛛 • 🕨 🛍	•	•		E
Name	Seq No		1+ 2		-	_	4+	5	.+	6	^
CBCUSTSD	0023.00	A	XWBCCD	11A	0	10	5TEXT('Cus	tomer	)		-
CBCUSTSD	0073.00	A	ZMSAGE	78A	0	24	2DSPATR (HI	)			
CBCUSTSD	0092.00	A	SFIELD	10A	Н						
CBCUSTSD	0105.00	A	ZWBCCD	11A	В	- 5	22				
CBCUSTSD	0132.00	A	ZWBNCD	2A	В	12	22				
CBCUSTSD	0136.00	A	ZPERSON	3A	В	13	22				
CBCUSTSD	0142.00	A	ZDSDCDE	2A	В	14	22				
CBCUSTSD	0175.00	A	ZMSAGE	78A	0	24	2DSPATR (HI	)			
CBCUSTSD	0202.00	A	SFIELD	10A	Н						1
<										>	

Variable When	e Used – Maximur	n Tracking View
---------------	------------------	-----------------

# FILE FIELD DETAILS

The **File Field Details** option displays the field details for a file. This option is available for objects having **PF/LF** attribute.

Right-click for the context menu on a PF/LF from the Member/Object List and select the **File Field Details** option. The following window will be displayed.



#### File Field Details for CUSF

🔓 Object Lis	t 🛛 🛱 File Field	Details 🕅							C	
File Field De	tails for XAN4CDE	M/CUSF, 1	fotal Field	s: 47					🖽 🖨	2 -
Mnemonic	Long Name	Туре	Length	Dec.Pos.	Inp.Buf.Pos.	Display	Grid Seq.	Record Screen Seq.	Headings	^
CNAME	Company	CHAR	00034		00001	Y	1.00	2.00	Company	
DSDCDE	Distributor	CHAR	00002		00035	Y	2.00	3.00	Distributor	
STATUS	Sts	CHAR	00001		00037	Y	3.00	4.00	Sts	
TELNO	Phone	CHAR	00017		00038	Y	4.00	5.00	Phone	
EXTN	Extn	CHAR	00006		00055	Y	5.00	6.00	Extn.	
LCTDAT	Last_Cnt_Date	ZONED	00006	00	00061	Y	6.00	7.00	Last Cnt Date	
APDATE	Next_Cnt_Date	ZONED	00006	00	00067	Y	7.00	8.00	Next Cnt Date	
USERNM	Contact	CHAR	00034		00073	Y	8.00	9.00	Contact	
SALUT	Salutation	CHAR	00034		00107	Y	9.00	10.00	Salutation	
JTITLE	Job_Title	CHAR	00034		00141	Y	10.00	11.00	Job Title	
FAXNO	Fax_No	CHAR	00015		00175	Y	11.00	12.00	Fax. No.	1

If there are keys for a PF or LF, they are displayed in blue color as shown in the image below.

🔓 Files 🛛 👔	🖥 File Field Details 🕺							
File Field Deta	ils for XAN4CDEM/CUS	TS, Total Fie	lds: 40				🏥 🖨 🛛	2
Mnemonic	Long Name	Туре	Length	Dec.Pos.	Inp.Buf.Pos.	Display	Grid Sec	ą. ^
XWBCCD	Customer	CHAR	00011		00001	γ	1.00	
XWG4TX	Name	CHAR	00040		00012	γ	2.00	
XWB2CD	Statement_Account	CHAR	00011		00052	Y	3.00	
XWB3CD	Related_Account	CHAR	00011		00063	γ	4.00	
XWHITX	Tax_Reg	CHAR	00015		00074	γ	5.00	
XWE0NB	Bank	PACKED	00009	00	00089	γ	6.00	
XWJUN0	Bank_A_c	PACKED	00015	00	00094	Y	7.00	
XWDVCD	Forex	CHAR	00003		00102	γ	8.00	
XWBNCD	CusGrp	CHAR	00002		00105	Y	9.00	
PERSON	Rep	CHAR	00003		00107	γ	10.00	
DSDCDE	Distributor	CHAR	00002		00110	Υ	11.00	
XWBTCD	Terms	CHAR	00003		00112	γ	12.00	
XWGIVA	Credit Limit	PACKED	00015	02	00115	γ	13.00	•
<							3	Þ

#### File Field Details showing key in blue color

# LFs/Access Paths

Select the LFs/Access Paths option to display all Access Paths for the selected physical file. Opt for the context menu on a PF from the Object/Member List, and then select the LFs/Access Paths option.

🔓 Object List	d Access Paths					
LFs/Access P	aths for CUSF, Total Ob	jects: 14				ê 🗵
Access Path	Text	Unique Keys	Select/Omit	Field Names	LF Seq.	Do Not Dis
CUSF	Sites	N	N		00000	N
CUSFLA	Sites by Product - ren	N	N	PRPCDE,CNAME	00003	N
CUSFLB	Sites by Orig.List	N	N	LSLCDE, CNAME	00004	N
CUSFLC	Sites by Salesperson	N	N	SINIT, CNAME	00005	N
CUSFLD	Sites by Validator	N	N	VINIT, CNAME	00006	N
CUSFLE	Sites by Organisation	N	N	ORG, CNAME	00007	N
CUSFL1	Sites by Name	N	N	CNAME	00001	N
CUSFL2	Sites by Status	N	N	STATUS, CNAME	00008	N
CUSFL3	Sites by Number	Y	N	CUSNO	00002	N
CUSFL5	Sites by Dist.& Status	N	N	DSDCDE,STATU	00009	N
CUSFL6	Sites By Dist. & Name	N	N	DSDCDE, CNAME	00010	N
<						>

In order to browse a source of any LF, double-click on it or select the **Zoom Source** option from the context menu.

# MEMBER X-REF

The **Member X-Ref** option lists all source lines where the field/variable has been used/referenced, in the source member and its associated Device Files and Copybooks.

A wide variety of options can be specified including:

Files, Array Definitions, Data Structures, Sub-Fields of Data Structures, Indicators, Key Lists, Data Fields, File Formats, Subroutines, Program Variable, Array Elements, Parameter Lists, Parameters, Key Fields, Message Ids, EXCPT Names, etc.

Double-click on a field in source member displays Member X-Ref. Alternatively, choose the **Member X-Ref** option from the context menu.

When this option is selected for a sub-item (such as a Sub-Field, Data Structure, Array Element or File Format), a list of the sub-items along with all references to the parent items is displayed. Double-click on the source line to view source of the object.

#### Member X-Ref view

🛃 Member X-R	ef 🛛	🖨 🛛 • 🔂 • 🚺 • 🗖 🗅
Member X-Refere	ence for CON001DF in XAN4CDEM/QRPGSRC (COI	NOO1), Lines: 14, View Level: 1
Seq No	*+ 1+ 2+ 3 .	+ 4+ 5+ 6 .
0002.00	FCONOO1DFCF E	WORKSTN
0003.00	F	@RRN1 KSFILE OESFL 📃
0041.00	C WRITEOECLR	99
0042.00	C WRITEOETRL	99 💻
0043.00	C EXFMT0ESFL	C 99
0063.00	C WRITEOETRL	99
0064.00	C EXFMT0ESFL	C 99
0074.00	C WRITEOETRL	99 💌

#### Legend

- Dark Red depicts the Definition Statements
- Black depicts the File Operations
- Magenta depicts the Parameters
- Dark Brown depicts the Program Structure Operation
- Dark Blue depicts the Field Operation.

#### Legend for Member X-Ref 🛃 Member X-Ref 🏼 🖨 🛛 • 🔂 • Member X-Reference for CON001DF in XAN4CDEM 📕 Definition Statements /el: ¹Ñ *...+... 1 ...+... 2 Seq No ...+.. File Operations 0002.00 FCON001DFCF E 0003.00 Parameters F ILE OES 0041.00 C 99 Program Structure Operation 0042.00 C 99 0043.00 C Field Operation 99

# **ENHANCED MEMBER X-REF**

The **Enhanced Member X-Ref** option displays the references of a variable in the member, along with information about how each subroutine handles this variable. It also presents the logical order in which the variable actually gets used, and not in the order of how it is physically placed in the source.



Source List of CON	001 in XAN	4CDEM/QRPGSRC	, Lines: 271, View Level: 5	A •
🗏 🝷 📑 🚰 🔚 😨	• 🗗 •	UM + 📴 + 🖀 🖪	📮 i 🗵 • 🖨 🛱 •	
Seq No *	+	1+ 2	+ 3+ 4	+ 5+🔼
0026.00	С*	Until F3		_
0027.00	С	* IN	*IN03	
0028.00	С*		*IN03	
0029.00	С*	Initialise	Add Bookmark	
0030.00	С		Variable Where Used 🔹 🕨	CMDDTA
0031.00	С		Member X-Ref	XWADD1
0032.00	С		Enhanced Member X-Ref 🔪	XWADD2
0033.00	C		Indicator Where Set 🛛 😽	XWADD3 🛛 🖌
<				>
📕 Business Rules 🖡				- 8
<u> </u>	_			
Member X-Reference f	or *1NU3 in	I XAN4CDEMJQRPG5F	(C (CONUUI)	
CON001	~ •			
0027.00	-	IN03 DOUEQ'1'		
0046.00	-	*INO3 IFNE '1'		
0067.00	_	*INO3 IFNE '1'		
0078.00	⊂ *	*INO3 IFNE '1'		
\$RVCON				
\$PRLNS				
SVALID				
\$CRCON				

# ADD BOOKMARK

Use the **Add Bookmark** option to access the facility and bookmark a selected source line in the Source List view.

		Add Book	mark option		
🕹 Object List		X			
Source List of C	ON001 in XAN4	4CDEPGSRC, Lir	es: 271, View Level: 5		<b>#1</b> •
🔲 🕶 🗈 🔚	😨 🕶 🚰 🕶 L	P - 📴 - 🐏 🖪	📃 i 🛛 • 🖨 🛱 •		
Seq No	*+	1+ 2	+ 3+ 4	ŧ+ 5	; . 🔼
0026.00	С*	Until F3			_
0027.00	С	* I			
0028.00	С*		*IN03		
0029.00	С*	Initialise	Add Bookmark 💦 📐		
0030.00	С		Variable Where Used 🤸 🕨	CMDDTA	
0031.00	С		Member X-Ref	XWADD1	
0032.00	С		Enhanced Member X-Ref	XWADD2	
0033.00	С		Indicator Where Set	XWADD3	~
<		) ^L			>

Select this option to invoke a dialog as shown below. You can edit the name of the Bookmark as per requirement.

Add Bookmark dialog
🖨 Add Bookmark 🛛 🗙
Enter Bookmark name:
C *IN03 DOUEQ'1'
OK Cancel

Click **OK** to bookmark the specific source line. The following image shows the bookmarked source line.

		Bookmarked selection – *IN03	
指 Object List	🖹 🔍 CON001 🛛 🕅		
Source List of CO	NOO1 in XAN4CI	EM/QRPGSRC, Lines: 271, View Level: 5	舟 -
🔲 🕶 🗈 🖶 🛅	😨 🔹 🚰 👻 💵	• 📴 • 🐂 📕 🗐 i 🔎 • 🖨 🗞 •	
Seq No	*+ 1	+ 2+ 3+ 4	+ 5+ 🔼
0025.00	С*		
0026.00	C* Un	til F3	
0027.00	С	*INO3 DOUEQ'1'	
0028.00	С*		
0029.00	C* 1	nitialise screen	
0030.00	C	MOVEACMD, 1	CMDDTA 🗾 🗸
<			>

To remove the bookmark, right-click on the bookmarked field and select the **Remove Bookmark** option or use the **Delete** option from the X-Analysis Bookmarks window.

To view the bookmarked items, click the **X-Analysis Bookmarks** icon featured on the X-Analysis toolbar.



When you click the icon, the following window is invoked:



		Х	-Analys	is Bookmarks wi	indow		
🛄 X-Analysis Boo	kmarks	×					§3 🗆 🗖
Object/Source	Des	cription			X-Ref Library	Location	
CON001	С	*IN03 D	OUEQ'1'		XAN4CDXA	line 27	
CUSF	A	CNAME	34A	TEXT('Company')	XAN4CDXA	line 2	
Local Shared							

#### • • . . . V A •

You also have the option to 'share' the bookmarks. When shared, the bookmarks become visible to others who are using the same cross-reference.

The following window displays the **Share** option:

💭 X-Analysis Book	marks S	×					\$ ' 🗆
Object/Source	Descri	iption			X-Ref Library	Location	
CON001	C	*IN03 D	OUEQ'1'		XAN4CDXA	line 27	
CUSF 🗎 Zoom S	ource	AME	34A	TEXT('Company')	XAN4CDXA	line 2	
📝 Share	N						
💢 Delete	Чŝ						
Local Shared							

#### X-Analysis Bookmarks context menu showing the Share option

1

# **Program Logic Documentation**

# DATA FLOW DIAGRAM

A Data Flow Diagram (DFD) is a diagrammatic representation of the data flow. A particular application contains many files and programs, and a DFD depicts all possible interrelationships among these multiple files and programs contained within a particular application. A color-coded DFD simultaneously plays the dual role of presenting the data flow at high object level, in addition to providing contextual details regarding specific variables and parameters passed between objects.

The Bus Routing DFD offers two benefits. One, it gives a precise idea of where and how the inputted data affects the desired output; two, it helps to visualize how an object within an application correlates with the other objects. The diagrams showing the data flow in neat blocks let even non-technical users get a clear picture of the object(s) interrelationships.

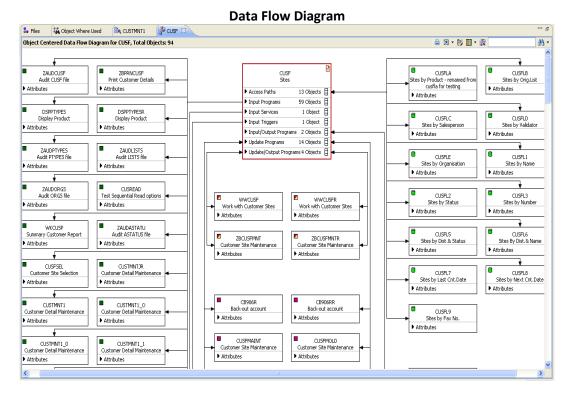
Select the **Data Flow Diagram** option from the context menu over an object, as shown below:

🎝 Files 🛛	👬 Object W	'here	Used	🗎 🔍 CUST	MNT1			E
Object List of *	ALLUSR/*A	LL/	*FILE/PF	*/*ALL/*AL	L, To	tal Objects: 50	番	Ŧ
🐝 • 🖨 🗵 •								
Library	Name		Туре	Attribute	Des	ription	Statu:	^
PFXAN4CDEM	CPYBKSRC		*FILE	PF	Cobo	I copybooks	*D	
PFXAN4CDEM	CUSF	D.					*B	-
PFXAN4CDEM	CUSGRP	<u>ا</u> ه	Zoom So	urce		mer Groups	*A	
PFXAN4CDEM	CUSTS		o i el			ases	*B	
PFXAN4CDEM	DELIVA	1 <b>.</b> -	Data Flo	w Diagram	N	ry Areas	*B	
PFXAN4CDEM	DISTS		Object W	/here Used	NZÞ	W jutors		
PFXAN4CDEM	EVFEVENT				•		*D	
PFXAN4CDEM	GENTAB		Variable Where Used			ic Table File	*D •	~
<		4	Data Mo	del Diagram			>	

**Data Flow Diagram option** 

This brings up the DFD for the object, CUSF.





The DFD is also a graphic equivalent of the Object Where Used data. Besides the Logical Views/Access Paths for CUSF, you can see how CUSF fits into the application (i.e. the programs that update CUSF, programs that use CUSF as an input file and so on).

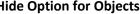
You will see how the dynamic and interactive diagram facilitates access to other features contained within an object. There are varied and flexible features and options like Hide/Show Objects, Expand/Collapse Referenced Objects, View Annotation, Attributes – all of these and more are explained ahead.

# Hide/Show Objects

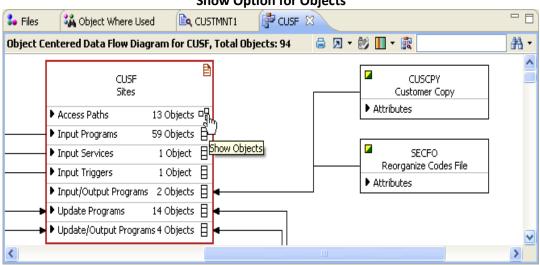
To have better understanding of object interrelationships, you may want to hide/show all objects pertaining to programs. A single-click action on the icon alongside the objects enables you to hide/show objects. In the following screenshot, the icon against **Access Paths** is clicked to hide objects.



		Hide	Option for	Objects		
🕹 Files 🛛 🆓 Object '	Where Used	CUSTMNT1	🚰 CUSF 🛛			
Object Centered Data	Flow Diagrar	n for CUSF, Total Obje	ects: 94	🖨 🛛 • 💕 🛽	- 🕅	<b>#</b> 1 •
CUSF Sites Access Paths Input Programs	13 Objects [ 59 Objects ]			CUSFLA s by Product - renamed from cusfla for testing ttributes	CUSFLB Sites by Orig.List Attributes	
<ul> <li>Input Services</li> <li>Input Triggers</li> <li>Input/Output Programs</li> </ul>	1 Object			CUSFLC Sites by Salesperson ttributes	CUSFLD Sites by Validator	
<						>



The following screenshot shows how another click displays all the objects within.

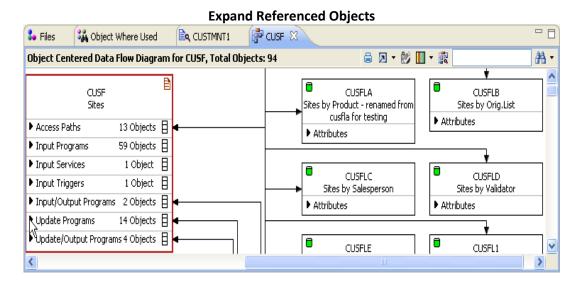


**Show Option for Objects** 

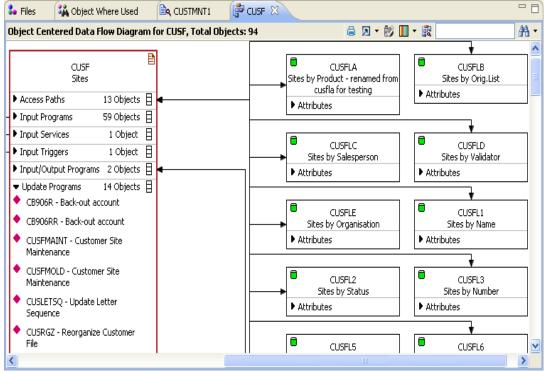
### **Expand/Collapse Referenced Objects**

The DFD takes another dynamic form when you expand the referenced object(s) on selecting a particular category from the main object's box. The following screenshot displays the action to be performed:





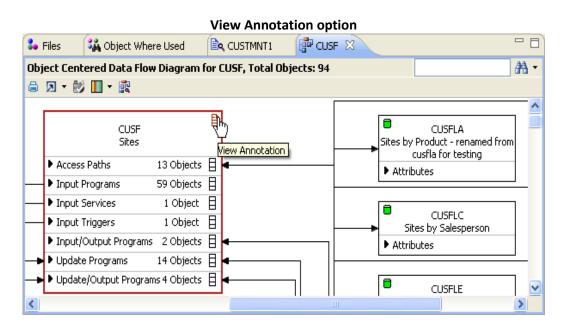
A single-click on the arrow icon adjacent to **Update Programs** reveals all the ten objects updating **CUSF**. The following screenshot displays the expanded view of the referenced objects' list:



**Expanded view of Update Programs** 

## **View Annotation**

The **View Annotation** option allows user to see annotation for a specific object. There is a red icon denoting Annotated text, on the right side of the Object (see the following screenshot).



Double-click on the **View Annotation** icon to invoke the Annotation dialog box, displaying the notes that had been written earlier.

You can further add/modify notes in the Annotation dialog box and click **Save**. These notes will be viewable later using the same option.

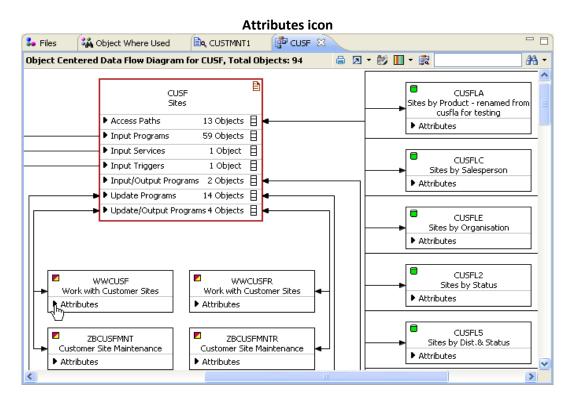
Annotation dialog							
🕹 Files 🛛 🆓 Object W	vhere Used 🛛 🗎 🔍 CUSTMNT1	🚰 CUSF 🗙					
Object Centered Data Flow Diagram for CUSF, Total Objects: 94							
🖨 🗵 • 💓 🚺 • 🕵							
			^				
CUSF	B	CUSFLA					
Sites		Sites by Product - re cusfla for tes					
Access Paths	13 Objects 🛛 🖣	Attributes					
🖨 Annotation for CUSF 🛛 🛛 🔀							
Additional Notes							
Hadicional noces							
Additional comments for CUSF. Wayne says so							
			<u>~</u>				
		Save Delete	Cancel				

Annotation dialog

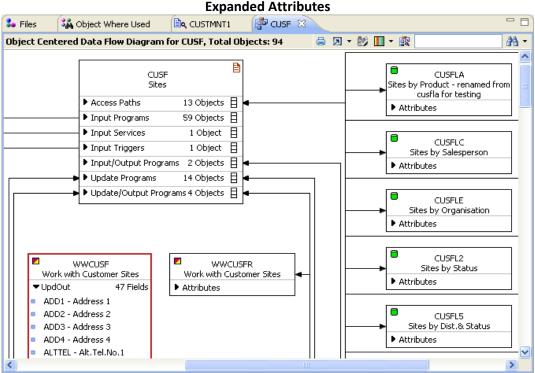
### Attributes

The **Attributes** feature comprises the impacted fields of a particular object. Through these fields, the main object is referenced.





The different objects corresponding to the main object have fields within them, implicit as 'Attributes'. These are easily accessible by a single-click on the Attributes icon. The term 'Attributes' is changed to related attribute – input, update, output etc., on expanding the Attributes button, as shown below:

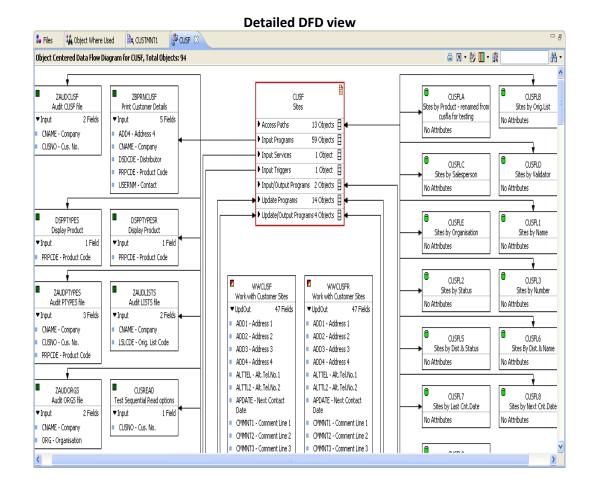


# Detail DFD icon

The **Detail DFD** presents the field usage of all the objects.

Detail DFD icon							
🐍 Files 🛛 🙀	Object Where Used	CUSTMNT1	🚰 CUSF 🕺				
Object Centered	l Data Flow Diagram	for CUSF, Total Ot	jects: 94		#A -		
🌢 🗵 • 😻 📗	* 🖪 📐						
	CUSF Sites 13 Objects			CUSFLA Sites by Product - rena cusfla for testir Attributes	med from		
<					>		

When you click on the **Detail DFD** icon on the toolbar, the Attributes section of all the objects gets expanded displaying referred fields from all objects. The following screenshot displays the detailed DFD screen:

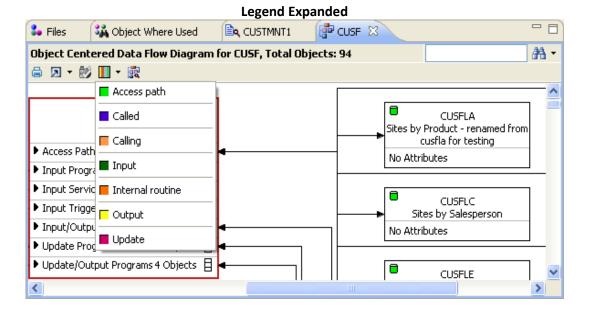


## Legend icon

The **Legend** icon on the toolbar displays details of the color scheme used by the DFD. Click the icon shown below:

		Legend	licon	
🕹 Files 🛛 🕄	👗 Object Where Used	CUSTMNT1	🚰 CUSF 🔀	- 8
Object Center	red Data Flow Diagra	m for CUSF, Total O	bjects: 94	<b>#</b> •
🖨 🗵 - 😢				
	Legend CUSF Sites	B	Sites by Produc	SFLA t - renamed from or testing
Access Path	ns 13 Objects	-	No Attributes	
- 🕨 Input Progr	ams 59 Objects	目		<u> </u>
<				>

The color scheme helps you understand the reference and association of specific objects, like how each object is referred to or used by the main object on which the DFD was opted. The expanded view of the **Legend** is given underneath.



Each object box has a colored square or disk on the top left corner. A disk denotes that the object is a file, whereas a square denotes a program. The description of the DFD Legend is as follows:

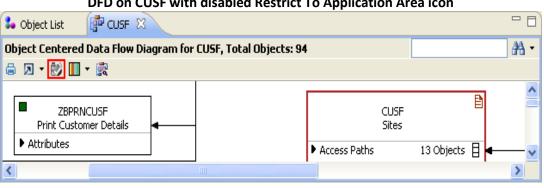
- Access Path This is the LF for the File on which the Data Flow Diagram has been opted.
- **Called** This is to represent programs called by the main program.

- **Calling** This denotes the programs calling the main program.
- Input For a program-centered DFD, this denotes an input file. For a file-centered DFD, this denotes a program taking input from the file.
- Internal Routines These are Synon-specific routines being called from a 2E program.
- **Output** For a program-centered DFD, this denotes an output file. For a file-centered DFD, this denotes a program giving output to the file.
- **Update** – For a program-centered DFD, this denotes an update file. For a file-centered DFD, this denotes a program updating the file.

### DFD Restricted to an Application Area

X-Analysis provides an additional feature related to DFDs. You can restrict the DFDs to the selected application area by clicking on the Restrict To Application Area icon. On clicking the icon, only those child objects are displayed which belong to the selected application area.

The following screen displays the DFD on CUSF. Notice that the Restrict To Application Area icon is disabled. This is so because this option gets enabled when any application area is selected.



### DFD on CUSF with disabled Restrict To Application Area icon

Now select the application area, MVCPROCESS.

Select the Data Flow Diagram option on CUSF; notice that the Restrict To Application Area icon is enabled (see the following screen). This is so because you have selected an application area.



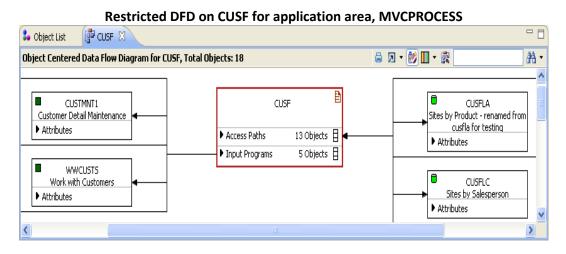
bject Centered Data Flow I	Diagram for CUSF, Total Objects: 94	🖨 🛛 • 🔡 🔲 • 🏟
ZAUDCUSF Audit CUSF file	ZBPRNCUSF Print Customer Details	CUSF Sites
Attributes	Attributes	Access Paths 13 Objects
¥		▶ Input Programs 59 Objects
DSPPTYPES	ZAUDPTYPES	► Input Services 1 Object
Display Product	Audit PTYPES file	► Input Triggers 1 Object
Attributes	Attributes	Input/Output Programs 2 Objects

Data Flow Diagram on CUSF with enabled Restrict To Application Area icon

Now, click on the **Restrict To Application Area** icon as shown below:

<b>Clicking Restrict To Application Area</b>	a icon
☑ - 🖾 🚛 - 🗊	<b>#</b> 1 •
Restrict To Application Area	~

The following screen is displayed:

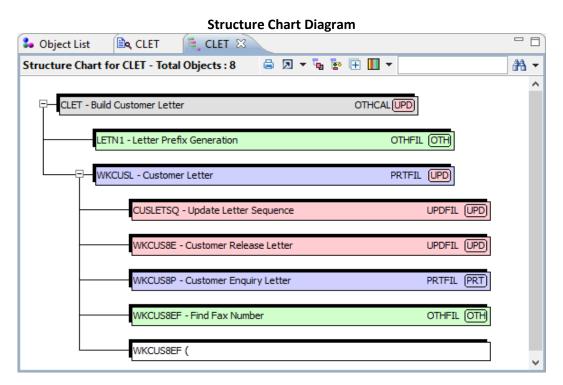


This tells us that the child objects belong to the application area, **MVCPROCESS**.

Note: While using the Restrict To Application Area feature, ensure that the originallyselected application area is not changed.

## **STRUCTURE CHART DIAGRAM**

Before undertaking an elaborate exercise of documenting program logic, it is imperative to understand how control transfers from one program to the next. A Structure Chart Diagram or SCD addresses this issue and represents the control through graphical, colorcoded block diagrams. Broadly speaking, the SCD is a nested tree diagram that shows the complete call hierarchy of the 'programs called'. These diagrams contain all the relevant information as per control flow and call structure. Moreover, you can view data input objects and avail a summarized description for each of the objects. Important functional aspects like updates, prints and displays are color coded to help you instantly focus on these commonly preferred details.



## Legend

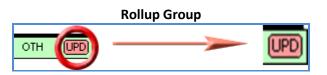
The SCD Legend describes the type of object displayed.

- **Update** This depicts the program that updates a file.
- **Display** This depicts the program that uses a Display file.
- **Print** This depicts the program that uses a Print file.
- **Input** This depicts the program that uses an Input file.
- **Output** This depicts the program that writes to a file.
- **Command** This simply depicts a Command.
- **Others** This refers to the Programs where it is referring to a file which is not Update/Display/Print/Input/Output.

Update Display Print Input Output Command Others Internal Routine Indeterminate Trigger Module

Internal Routine – This refers to the Synon-specific routines.

- **FRESCHE** LEGACY
- Indeterminate This depicts the programs where the usage cannot be programmatically determined.
- **Trigger** This depicts the program which is a Trigger.
- Module This depicts the program which is a Module.



The Rollup group describes the cumulative component function of the program and its dependents.

The following types of Rollup groups are available:

- UPD At least one program updates a file.
- PRT Program and dependent programs create a printed report.
- DSP Program and dependent programs use input files and display files.
- OTH No cumulative component function can be determined.

### **Function Type**

Function Type describes the function of the object and is based on COOL: 2E definitions.

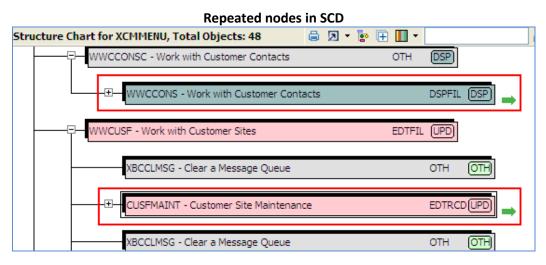
### **Hierarchy Exclusions in SCD**

**Work with Exclusions** is **Option 16** on the **X4WRKAPP** master command menu. With the help of this feature you can add a program's name for Hierarchy Exclusions. This has effect in the SCD and the OSC. This feature removes the child nodes of the excluded object and a green arrow is displayed to indicate the hierarchy exclusion. The following screen shows this feature.

Hierarchy Exclusions in SCD	
So Object List 🔄 CUSFMAINTC 🛛	- 8)
Structure Chart for CUSFMAINTC - Total Objects : 2 📾 🗷 🔻 🖥 😰 🕀 🔟 🔻	#1 -
-b	^
CUSFMAINTC - Customer Site Maintainance OTH UPD	
CUSFMAINT - Customer Site Maintenance     EDTRCD [UPD]	
	Υ.

## **Repeated nodes in SCD**

The SCD displays the repeated objects (having child nodes) with a green arrow beside them. The following image shows the repeated nodes in an SCD.



## **Structure Chart Diagram with Files**

The SCD provides a graphic display of the program-to-program relationships. The SCD with files also displays associated files along with programs. To see the SCD with files, click on the **Show Files** icon available on the SCD toolbar.

		Sh	ow File	s icor	ı		
🕹 Object List	🖹 🔍 CLET	🔋 CLET 🕱					- 8
Structure Chart	for CLET - Tot	al Objects : 8	8 🛛	- <b>G</b>	💽 🕀 🔳 🔻		<b># -</b>
					Show Files	1	0



Structure Chart Diagram with I/O Files	
b Object List 🔍 CLET 🛛 🗧 CLET 🛛	
Expanded Structure Chart for CLET - Total Objects : 19 🖨 🗵 🔻 🖥 💽 🕀 📗 💌	æ
CLET - Build Customer Letter OTHCAL	
LETN1 - Letter Prefix Generation     OTHFIL OTH	
CUSFL3 Sites by Number	
WKCUSL - Customer Letter PRTFIL	
QLETSRC	
CUSLETSQ - Update Letter Sequence UPDFIL UPD	
CUSFL3 Sites by Number	

## **Structure Chart Diagram – Show Overridden Files Only**

In the case of only **CLP/CLLE** objects, the SCD has the feature that displays the Overridden Files. The following image shows the **Show Overridden Files Only** icon.

### Show Overridden Files Only icon

🕹 Object List	🖻 🔍 CLET	CLET X	
Structure Chart for	or CLET - Total	Objects : 8 🖨 🗵 🔻 🌆 😰 🕀 🚺 🔻	<b># -</b>
		Show Overridden Files Only	0

When the icon is clicked, the following window is displayed:

<

>



🕹 Object List	SCD – Show Overridden Files Only window	- E
Structure Chart	with Overridden files for CLET - Total Objects : 11 🛛 🖨 🗵 🔻 🛐 😰 🕀 📗 💌	A •
CLET - Bui	ld Customer Letter OTHCAL	^
	TN1 - Letter Prefix Generation OTHFIL OTH	
L₽_ <mark>w</mark>	KCUSL - Customer Letter PRTFIL	
	CUSLETSQ - Update Letter Sequence UPDFIL (UPD)	
	WKCUS8E - Customer Release Letter     UPDFIL UPD	
	QFAXSRC	
	WKCUS8P - Customer Enquiry Letter     PRTFIL PRT	
	QSECTXT QSECTXT	
	WKCUS8EF - Find Fax Number OTHFIL OTH	
	WKCUS8EF (	

## **Detailed Structure Chart**

Generate the Detailed SCD by clicking the **Show Narratives** icon from the toolbar of both the SCD and the Expanded Structure Chart Diagram.

The following image shows the icon.



**Show Narratives icon** (= 

🕹 Object List	🗈 CLET	🖲 CLET 🛛	3		- 8
Structure Chart fo	or CLET - Total	Objects : 8	🖨 🗵 🔻 🖥	E [] ▼	<b>#</b> •
				Show Narratives	¢

The image below shows the detailed SCD for the selected object, CLET.

Detailed Structure Chart Diagram		
🕹 Object List 🗈 CLET 🖾		
Detailed Structure Chart for CLET - Total Objects : 19 🖨 🗵 🔻 🖥 😨 🗐 🔳 🔻	睂	-
		^
CLET OTHCAL UPD Build Customer Letter Program: Build Customer Letter. A principal function of this program is to make certain calculations then return the values to the calling program. The following programs are called to carry out subsidiary functions: LETN1, WKCUSL.		
LETN1 OTHFIL OTH Letter Prefix Generation Program: Letter Prefix Generation. A principal function of this program is to read file CUSFL3, the Sites by Number file. Parameters are passed to the program when it is called. The program is called by: CLET, CLETN, CPDM, CUSLET1.		
Input - CUSFL3 Sites by Number		
WKCUSL PRTFIL UPD Customer Letter Program: Customer Letter. A principal function of this program is to produce a report on QLETSRC. The following programs are called to carry out subsidiary functions: CUSLETSQ, WKCUS8EF, WKCUS8EF (, WKCUS8P. Parameters are passed to the program when it is called. The program is called by: CLET, CUSLET 1.		~



The Rollup group describes the cumulative component function of the program and its dependents.

The following types of Rollup groups are available:

- UPD At least one program updates a file.
- PRT Program and dependent programs create a printed report.
- DSP Program and dependent programs use input files and display files

OTH – No cumulative component function can be determined

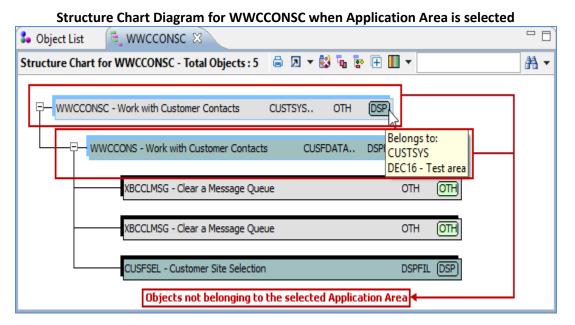
### **Function Type**

Function Type describes the function of the object and is based on COOL: 2E definitions.

## **APPLICATION AREA SCD**

When you select the **Structure Chart Diagram** option on an application area (the application area node should be selected), then objects not belonging to the selected application area are highlighted in blue. The names of the application areas are displayed on the tool tip of those objects which do not belong to the selected application area.

While using the Restrict To Application Area feature, ensure that the originally-selected application area remains the same.

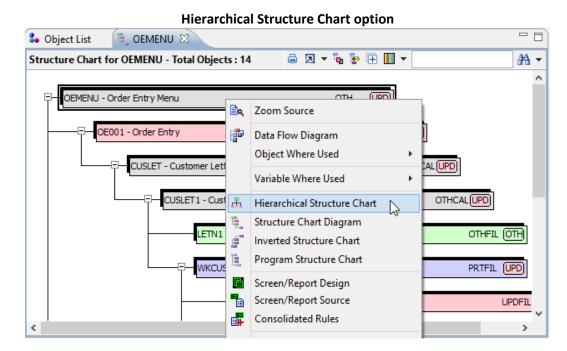


Note that the SCD can be limited by level as well as volume. This is applicable to the interactive mode of SCDs. You must set the 'Preferred Volume Limit' in the X-Analysis General Preferences dialog.

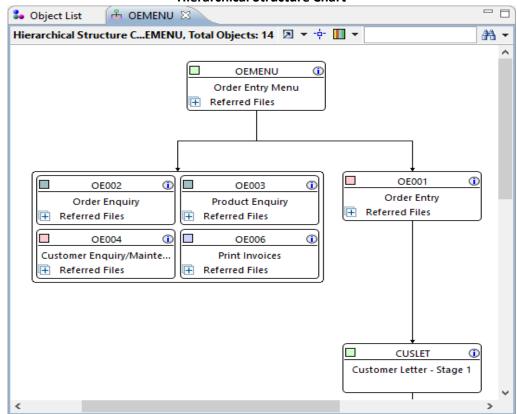
## **HIERARCHICAL STRUCTURE CHART DIAGRAM**

The Hierarchical Structure Chart Diagram offers a different layout for viewing the SCD. This illustration offers a well-defined view of all the programs by representing their control flow and call structure. Neat, color-coded bus routing block diagrams depict the movement of control / programs. Select the **Hierarchical Structure Chart** option for any object from the context menu. In the following screenshot, **OEMENU** is selected.





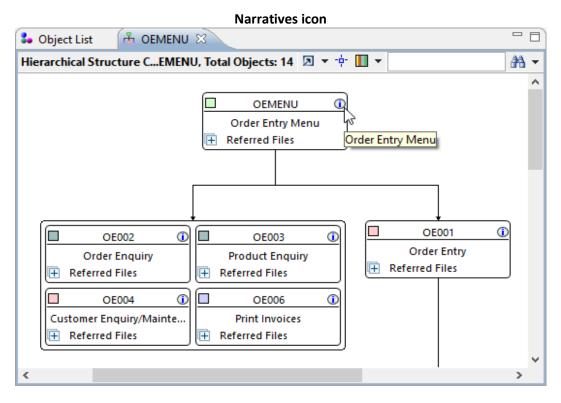
The screenshot below shows the delineation of the main object **OEMENU** into several blocks of related objects in the order of calling. The color codes signify the identity of objects as command-based or input-based or print-based, and so on.



**Hierarchical Structure Chart** 

## Narration

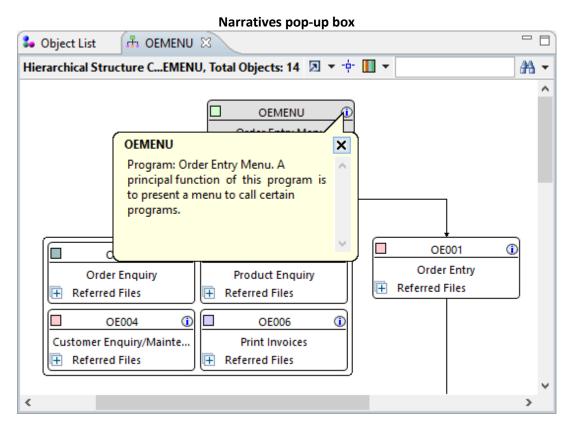
Access the additional details related to an object through the ⁽¹⁾ icon.



Click on the icon to invoke a pop-up window which provides the auto-generated narration for the program, as shown below:



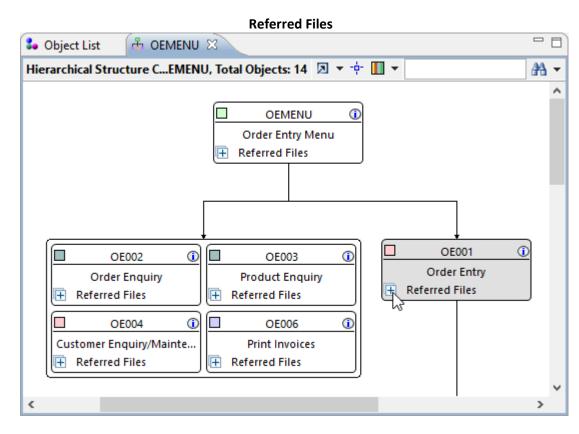




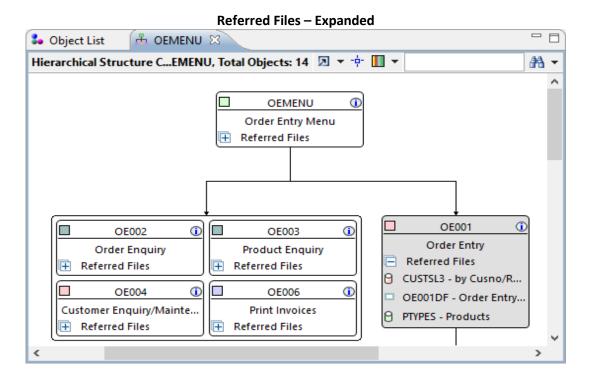
## **Referred Files**

The Hierarchical Structure Chart has a feature which displays the referred files inline. An expandable icon called **Referred Files** is available in each box. Click on the H icon preceding **Referred Files**.





The box will expand to display the files referred to by **OE001**. The color-coded geometric shape before the file name indicates the file type.



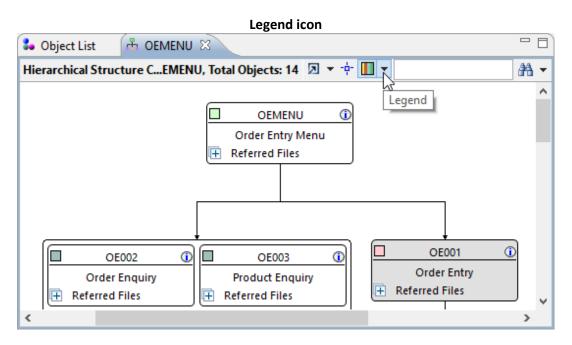
## Show Root Node

Click the **Show Root Node** icon to display the root node:

Show Root Node icon	
🕹 Object List 🛛 🕂 OEMENU 🛛	- 8
Hierarchical Structure CEMENU, Total Objects: 14 🛽 🔻 💠	🔲 🔻 🔛 🏯 👻
OEMENU Order Entry Menu Treferred Files	Show Root Node
CE002 (i) Order Enquiry H Referred Files CE003 (i) Product Enquiry Referred Files	OE001 Order Entry Referred Files

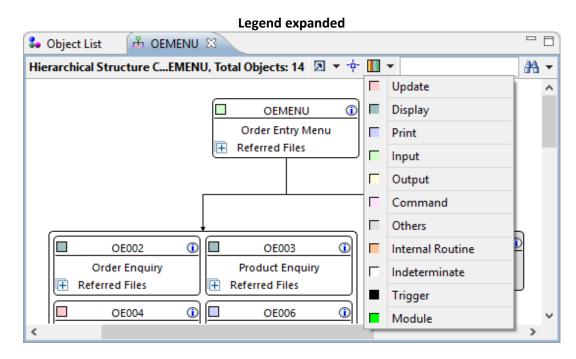
## Legend icon

The **Legend** icon on the toolbar displays details of the color scheme used by the Hierarchical SCD. The colors help in establishing the reference and association of specific objects. Click the **Legend** icon, as shown below:



The following image shows the expanded view of the Legend:



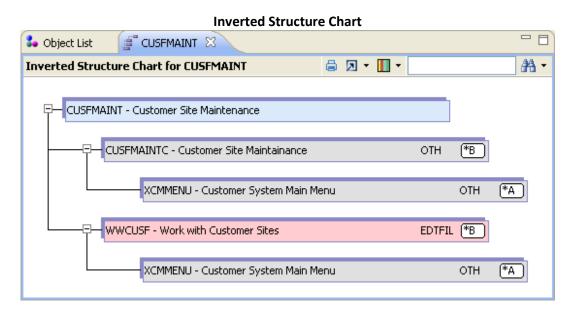


The description of the HSC Legend is as follows:

- **Update** This depicts the program that updates a file.
- **Display** This depicts the program that uses a Display file.
- **Print** This depicts the program that uses a Print file.
- **Input** This depicts the program that uses an Input file.
- **Output** This depicts the program that writes to a file.
- **Command** This simply depicts a Command.
- Others This refers to the Programs where they are referring to a file which is not Update/Display/Print/Input/Output.
- **Internal Routine** This refers to the Synon-specific routines.
- Indeterminate This depicts the programs where the usage cannot be programmatically determined.
- **Trigger** This depicts the program which is a Trigger.
- **Module** This depicts the program which is a Module.

## **INVERTED STRUCTURE CHART**

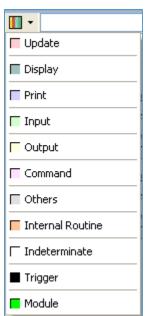
The Inverted Structure Chart depicts the reverse order of the calling programs. In other words, it traces the backward movement of how a specific program gets called. It shows the immediate calling programs that may be the same for the other programs called. In the screenshot below, **XCMMENU** program is calling for both **WWCUSF** and **CUSFMAINTC** along with the main called program, **CUSFMAINT**.



## Legend

The image and the description of the **Inverted Structure Chart Legend** are as follows:

- **Update** This depicts the program that updates a file.
- **Display** This depicts the program that uses a Display file.
- **Print** This depicts the program that uses a Print file.
- **Input** This depicts the program that uses an Input file.
- **Output** This depicts the program that writes to a file.
- **Command** This simply depicts a Command.
- Others This refers to the Programs where they are referring to a file which is not Update/Display/Print/Input/Output.
- Internal Routine This refers to the Synon-specific routines.





- Indeterminate This depicts the programs where the usage cannot be programmatically determined.
- **Trigger** This depicts the program which is a Trigger.
- **Module** This depicts the program which is a Module.

The Inverted Structure Chart can also be viewed as the diagrammatic representation of **Object Where Used > Entry Level References** for a particular program. The references appear as a list in tabular form that gives the lead of the calling object. In this case it is **XCMMENU**, as shown in the screenshot below:

🕹 Object List	t 📜	CUSFMAINT	E CUSFMAIN	r 🛛 🙀 Object Where I	Used 🛛	
Object Whe	re Used -	Entry Level R	eferences for Cl	JSFMAINT, Total Objec	ts: 1	ê 🛛 -
Object	Туре	Text		Usage	Library	
XCMMENU	*PGM	Customer Sys	tem Main Menu	Entry Level Reference	XAN4CDEM	

### **Entry Level References List – XCMMENU**

## **PROGRAM STRUCTURE CHART/PSC**

The Program Structure Chart graphically displays the sequence of calls in the program. The call operation can perform the following:

- Execute a Subroutine
- Execute a Sub-Procedure
- Execute a Program/Module/Service Program.

The subroutines are displayed as small rectangles with grey background, displaying name of the subroutine. The object's Function Type determines the coloring of all other boxes viz. Programs, Modules, and Service Programs.

Boxes other than the subroutine boxes, are of the size of program element as on the Structure Chart.



Program Structure Chart	
So Object List 📋 OE001 🛛	
Program Structure Chart for OE001, Total Objects: 6 🛛 🖨 🗵 🔻 🚺 🔻	A -
무 OE001 - Order Entry	
	<u> </u>
CUSLET - Customer Letter - Stage 1	
\$RVCUS	
\$ORLN5	
\$VALID	
\$CRORD	

The menu options and context menu options on the PSC work the same way as on the SCD, except for the **Zoom Source** option.

If there is no Main Procedure and only sub-procedures exist, then the PSC displays each sub-procedure's PSC independently, one after the other. If no sub-procedures exist then the PSC only displays the program.

### Legend



There are two colors in the PSC Legend. White depicts the calling Programs or Modules. Gray depicts the calling Subroutines or Procedures.

## **OVERVIEW STRUCTURE CHART/OSC**

The OSC gives a snapshot of an application displaying all entry points to the application. The details of all the mainline entry-level programs are displayed, which give an idea of the modules and sub-modules present in an application.

The **Overview Structure Chart** node is available under the cross-reference library node and application area(s) node. Double-click the **Overview Structure Chart** node to display the following dialog.



# Overview Structure Chart dialog w Structure Chart

Cverview S	tructure Cr	art	
Application Are	a:	Description	
*NONE	~	All Members Selected	
Library(s)			
Object Libra	ary		
*ALL	~		
Program			
Name	*ALL		
Text			]
OSC Data Opti	on		
ORe-Use ca	ched OSC data	(if exists) 💿 Re-generate OSC data	•
	ОК	Cancel	

The **Overview Structure Chart** dialog prompts you to:

- 1. Select the Application Area name, if available, else leave it as *NONE.
- 2. Pick the Object Library from the drop-down list.
- 3. The Program Name will be set as *ALL.
- 4. Select **OSC Data Option** to re-use cached data or re-generate data.

Click **OK** to display the Objects' OSC based on the selection criterion.



### **Overview Structure Chart window**

= Overview Structure Chart 🛛		
Overview Structure Chart for XAN4CDXA/*ALL/*ALL, Total Obje	ects: 1005 🖨 🗵 🔻 📴 🕀 📗 🔻	待・
B-CBC110 - Order Entry System	OTHFIL (UPD)	<u>^</u>
	EDTFIL (UPD)	
X@GSCD - Generate Code	отн отн	
CD007D		
CB907R		
E-CLET - Build Customer Letter	OTHCAL	
LETN1 - Letter Prefix Generation	OTHFIL OTH	
	PRTFIL UPD	
CUSLETSQ - Update Letter Sequence	UPDFIL (UPD)	
WKCUS8EF - Find Fax Number	OTHFIL OTH	~

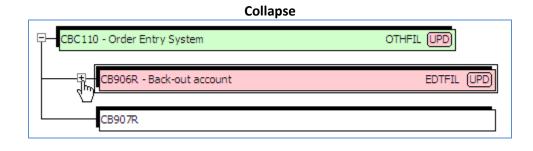
### Legend

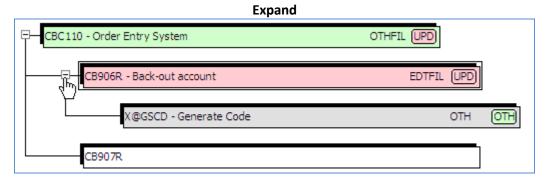
The description of the OSC Legend is as follows:

- **Update** This depicts the program that updates a file.
- **Display** This depicts the program that uses a Display file.
- **Print** This depicts the program that uses a Print file.
- **Input** This depicts the program that uses an Input file.
- **Output** This depicts the program that writes to a file.
- **Command** This simply depicts a Command.
- Others This refers to the Programs that are referring to a file which is not Update/Display/Print/Input/Output.
- Update
  Display
  Print
  Input
  Output
  Command
  Others
  Internal Routine
  Indeterminate
  Trigger
  Module
- Internal Routine This refers to the Synon-specific routines.
- Indeterminate This depicts the programs where the usage cannot be programmatically determined.

- **FRESCHE** LEGACY
- **Trigger** This depicts the program which is a Trigger.
- Module This depicts the program which is a Module.

The OSC can be expanded/collapsed using the button on the lines.





**Rollup Group** 

CBC110 - Order Entry System	

The Rollup group describes the cumulative component function of the program and its dependents.

The following types of Rollup groups are available:

- UPD At least one program updates a file.
- PRT Program and dependent programs create a printed report.
- DSP Program and dependent programs use input files and display files.
- OTH No cumulative component function can be determined.

### **Function Type**

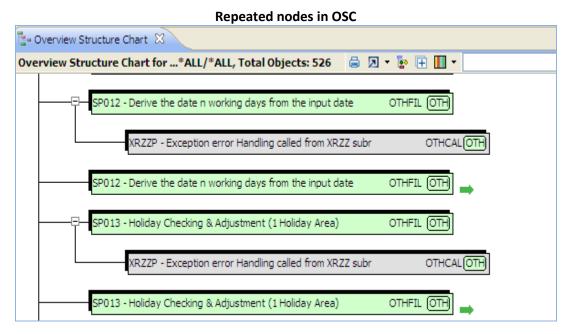
Function Type describes the function of the object and is based on COOL: 2E definitions.

## **Hierarchy Exclusions in OSC**

**Work with Exclusions** is an option on the master command menu **X4WRKAPP** (**Option 16**). Using this feature you can add a program's name for Hierarchy Exclusions. This has effect in the OSC and the SCD. This feature removes the child nodes of the excluded object and a green arrow is shown to indicate the hierarchy exclusion.

## **Repeated Nodes in OSC**

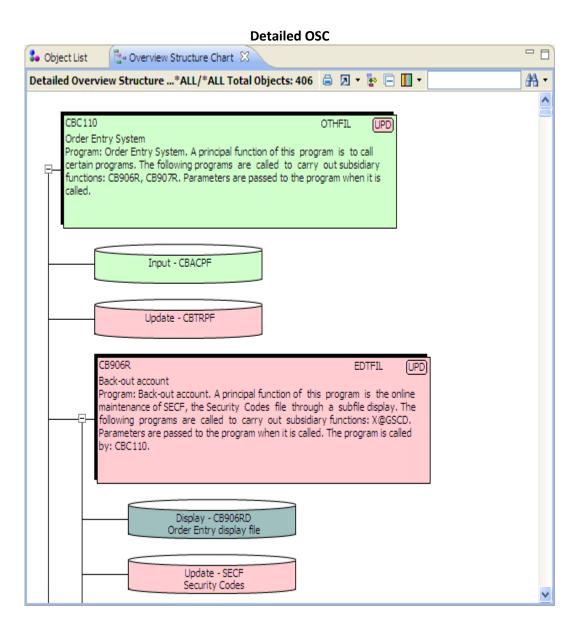
The OSC displays the repeated objects (having child nodes) with a green arrow beside them. The following screen displays repeated nodes in OSC.



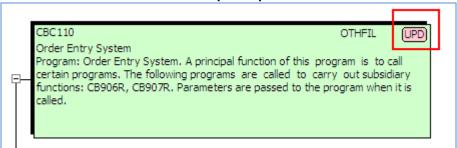
## **Detailed OSC**

Click on the **Show Narratives** icon to invoke the Detailed Overview Structure Chart.. It is available on the toolbar associated with the OSC.





**Rollup Groups** 



The Rollup group describes the cumulative component function of the program and its dependents.

The following types of Rollup groups are available:



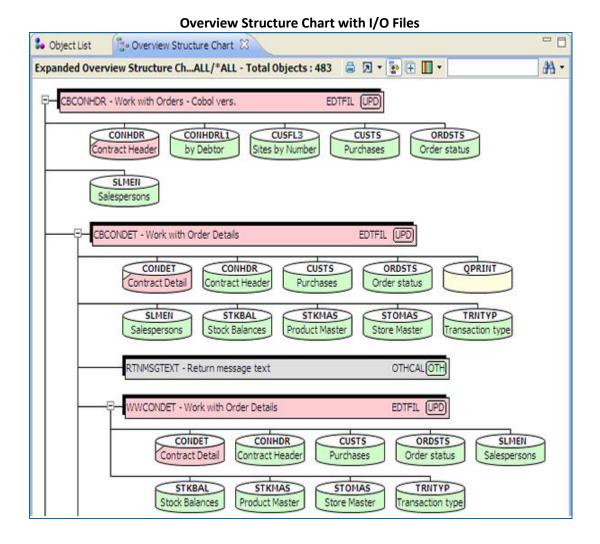
- UPD At least one program updates a file
- PRT Program and dependent programs create a printed report
- DSP Program and dependent programs use input files and display files
- OTH No cumulative component function can be determined.

### **Function Type**

Function Type describes the function of the object and is based on COOL: 2E definitions.

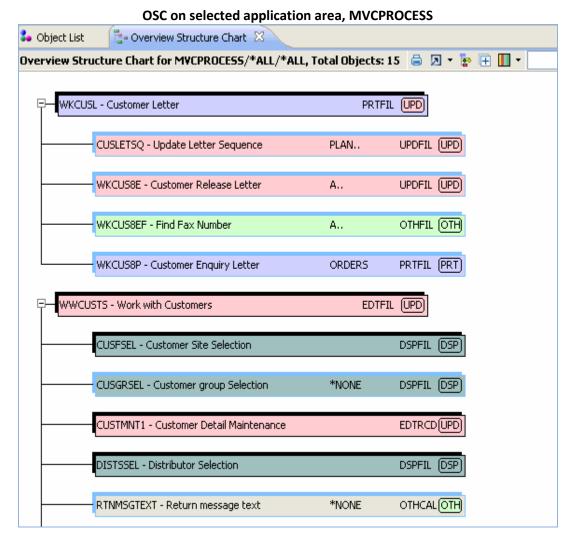
### **OSC** with Files

The Normal Overview Structure Chart displays a snapshot of an application using programs only. Click the **Show Files** icon available on the OSC toolbar to display the available files along with the programs.



## **Application Area OSC**

When you select the **OSC** option on an application area (Application Area node should be selected), then objects not belonging to the selected application area are highlighted in blue. The names of application areas are displayed on the tool tip of those objects not belonging to the selected application area.



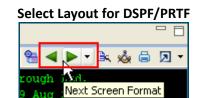
## SCREEN/REPORT DESIGN

The **Screen/Report Design** option works on Display and Printer Files. It displays the actual layout for the Display/Printer file. This option also works on program objects (RPG, RPGLE and MENU) and displays the layout of the associated Display/Printer files.



🛛 Object List 🛛 🛄 D	)evice De:	sign 🖾 🗌							1
creen Design for CNT	CMAINT	D - ZZFTO1	L				🖀 🖳	🖪 🖨 🛛	3
X-Analysis				Prin	t display	file			
XAPRTDSPF									
			Displ	ay_file_:	_CNTCMAIN	TD			
Customers		Contact	s Mainten	ance		Dat	aborou	gh Ltd.	
0000000000							99	9:99:99	
							00000	0000000	
Customer No		666	66						
Product Code .		BB							
Contact Name .		BBB	BBBBBBBBB	BBBBBBBBB	BBBBBBBBB	BBBB			
Telephone No .									
Fax. No									
Email Address .							DDDDDDD	ggggg	
							וממממממ	ממממנ	
Last Contact Da									
Next Contact Da	ite	• • BBB	BBBBBBBB						
Salesperson									
Salesperson Status									
-		в	000000000	000000000	000000000	000000000	0000000	000000	
Status		в		000000000 d_format(			0000000	000000	
Status		в					0000000	000000	
Status 000000000000000000000000000000		в					000000	000000	
Status 000000000000000000000000000000		в							
Status 000000000000000000 <z2ft01></z2ft01>		в							3
Status 000000000000000000000000000000	000000	B	Recor					0000000 🎄 🗊 [—]	1
Status         000000000000000000000000000000000000	000000	B 00000000	Recor						
Status 00000000000000000000 <zzft01> Screen Fields X eld details for CNTCMAIN Label</zzft01>	0000000	B 00000000	Recor	d_format(	3)	Attribute	0-€ ∎€ )	å 률 [–]	
Status 00000000000000000000 <zzft01> Screen Fields X eld details for CNTCMAIN Label</zzft01>	NTO1D, To Line	B 00000000 otal Objects Column	Recon : 12 Field	d_format(	s) File	Attribute Output	o€ ∎€ ; Type	🎄 🚮 🗁	
Status 000000000000000000000000000000000000	0000000 JT01D, Tc Line 2	B 00000000 otal Objects Column 2	Recon : 12 Field ZZPGM	d_format(	s) File WorkField	Attribute Output	o€ ∎€ ; Type A	کی 🛃 🖆 Length	
Status OCOCOCOCOCOCOCOCO CZZPTO1> Screen Fields S Id details for CNTCMAIN Label Databorough Ltd. Customer No	JTO1D, To Line 2 3	B 00000000 otal Objects Column 2 69	Recon : 12 Field ZZPGM ZZDATE	d_format(	s) File WorkField WorkField	Attribute Output Output Both	of∰ ∎€ ) Type A A	کی 🛃 🖆 Length 10 11	
Status COCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	UTO1D, To Line 2 3 4 5 6	B 00000000 otal Objects Column 2 69 28	Recon : 12 Field ZZPGM ZZDATE CUSNO	d_format(	s) File WorkField WorkField CNTACS	Attribute Output Output Both Both	O€ ■€ s Type A A S	دی ایک ایک ایک ایک ایک ایک ایک ایک ایک ای	
Status COCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	UTO1D, To Line 2 3 4 5	B 00000000 0000000 000000000 0000000000	Recon 12 Field ZZPGM ZZDATE CUSNO ZPRPCDE	d_format(	s) File WorkField WorkField CNTACS WorkField	Attribute Output Output Both Both Both	O€ ■€ > Type A A S A	Length 10 11 5 2	
Status OCOCOCOCOCOCOCOCO CZZFTO1> Screen Fields S eld details for CNTCMAIN Label Databorough Ltd. Customer No Product Code Felephone No Fax. No	UTO1D, To Line 2 3 4 5 6	B 00000000 0000000 00000000000000000	Record 12 Field ZZPGM ZZDATE CUSNO ZPRPCDE ZUSERNM	d_format(	s) File WorkField WorkField CNTACS WorkField WorkField	Attribute Output Output Both Both Both Both Both Both	O€ ■€ > Type A A S A A A	Length 10 11 5 2 34 17 15	
Status OCOCOCOCOCOCOCOCO CZZFTO1> Screen Fields S eld details for CNTCMAIN Label Databorough Ltd. Customer No Product Code Felephone No Fax. No	UTOID, To Line 2 3 4 5 6 7	B 00000000 0000000 00000000000000000	Record 12 Field ZZPGM ZZDATE CUSNO ZPRPCDE ZUSERNM ZTELNO	d_format(	s) File WorkField WorkField CNTACS WorkField WorkField WorkField	Attribute Output Output Both Both Both Both Both Both	Generation of the second seco	Length 10 11 5 2 34 17	
Status COCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCO	UTOID, To ITOID, To 2 3 4 5 6 7 8 9 10	B 00000000 0000000 00000000000000000	Record 12 Field ZZPGM ZZDATE CUSNO ZPRPCDE ZUSERNM ZTELNO ZFAXNO	d_format(	s) File WorkField WorkField CNTACS WorkField WorkField WorkField WorkField	Attribute Output Output Both Both Both Both Both Both Both Bot	Generation of the second seco	Length 10 11 5 2 34 17 15	
Status            000000000000000000000000000000000000	UTOID, To ITOID, To 2 3 4 5 6 7 8 9 10	B 00000000 0000000 00000000000000000	Record : 12 Field ZZDATE CUSNO ZPRPCDE ZUSERNM ZTELNO ZFAXNO ZEMAIL	d_format(	s) File WorkField WorkField CNTACS WorkField WorkField WorkField WorkField WorkField	Attribute Output Output Both Both Both Both Both Both Both Bot	Type A A A A A A A A A A A A	Length 10 11 5 2 34 17 15 50	
Status OCOCOCOCOCOCOCOCOCO CZZPTO1> Screen Fields X eld details for CNTCMAIN Label Databorough Ltd. Customer No Forduct Code Contact Name Fax. No Fax. No Status Contact Date Contact Data Contact Data Contact Data Contact Data Contact Data Contact Data Contact Data Contact Data Contact Data Contact Da	UTOID, To ITOID, To 2 3 4 5 6 7 8 9 10	B 00000000 0000000 00000000000000000	Record : 12 Field ZZPGM ZZDATE CUSNO ZPRPCDE ZUSERNM ZTELNO ZFAXNO ZEMAIL ZLCTDAT	d_format(	s) File WorkField WorkField CNTACS WorkField WorkField WorkField WorkField WorkField	Attribute Output Output Both Both Both Both Both Both Both Bot	Type A A A A A A A A A A A A A A A A A A A	Length 10 11 5 2 34 17 15 50 10	

If more than one Display or Printer File is associated with a program, then the Screen/Report Design will display Screen Design list icon for selecting the DSPF/PRTF to display.





Screen/Report Layout view

🕹 Object List 🛛 🔳 Device Design 🔀			
Report Layout for OE006RT		• • •	• 🖨 🛛 •
X-Analysis			
	Printer File	: OE006RT	
		INVO	I C E
Order Date: 8/10/12			
Order No: 9999R			
Customer X000000000000000000000000000000000000	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	xxxxxxx	
Address XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	000000X	
200000000000000000000000000000000000000	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	000000X	
200000000000000000000000000000000000000	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	00000X	
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Line Product Description	Quantity	Unit Price	Cost
99999 9999R X000000000000000000000000000	99,999	99,999.99	99,999.
		Total Cost:	99,999.
Terms: 1. Days to pay: 999			
Carrier:			
	Record Format	:(s)	
<00HD01> <00DT01> <00END>			
<			>

If you select the **Screen/Report Design** option while documenting, then the current Screen Design will be printed with the Field Details. An option for detailed documentation of Screen Design has been provided in the System Documenter Wizard.. Select the **Detailed** option to also print the DCD, ACD, and header information for each screen

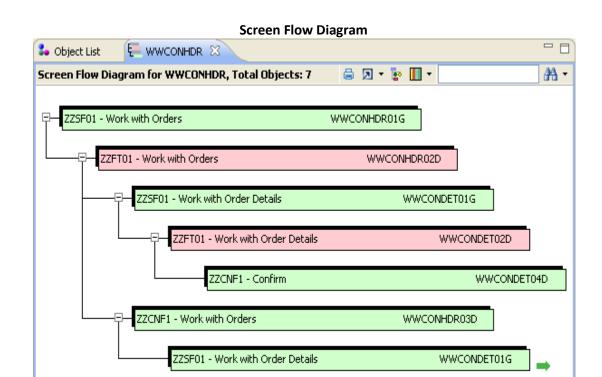
## SCREEN FLOW DIAGRAM

The Screen Flow Diagram is an extended form of Activity Diagram for RSA/RSM. It displays the screens' flow for a program. This diagram is available on RPGLE/RPG. There are four types of screens:

- Subfile (Screen with a dependent grid)
- Update capable screen
- Display only screen
- Repeated node

Select **WWCONHDR** from the Object List of the tutorial application. Opt for the context menu on it, and then select the **Screen Flow Diagram** option. The following image displays the Screen Flow Diagram for **WWCONHDR**.





### Legend

The Screen Flow Diagram Legend illustrates the type of object displayed.

Subfile – This refers to the object using a Subfile.	Subfile	
	🔲 Update	
<b>Update</b> – This refers to the object updating a file.	🗖 Display	
<b>Display</b> – This refers to the object using a Display file.	Primary File	
Primary File – This refers to the PF used by the object.	Secondary File	
Secondary File – This refers to the Secondary File used by the object.	☐ Indeterminate	

Indeterminate – This refers to the objects where the usage cannot be programmatically determined.

### **Repeated Nodes in Screen Flow Diagram**

The Screen Flow Diagram displays the repeated nodes in their original color. Also, an arrow of the same color is displayed for the repeated nodes (having child nodes). The following image displays repeated nodes in Screen Flow Diagram.

WWCONDET01G



Screen Flow Diagram with	the repeated node		
Se Object List 🗧 WWCONHDR 🛛			
Screen Flow Diagram for WWCONHDR, Total Objects: 7	🖨 🗵 = 📴 👖 =		<b>#</b> -
모 ZZSF01 - Work with Orders	WWCONHDR01G		
		5	
ZZFT01 - Work with Orders	WWCONHDR02D		
ZZSF01 - Work with Order Details	WWCONDE	TOIG	
ZZFT01 - Work with Order Details	WV	CONDETC	12D
ZZCNF1 - Confirm		WWC	Repeated Node
ZZCNF1 - Work with Orders	WWCONHD	R03D	
			¥

The **Show Files** icon is provided to show the files used by the function.

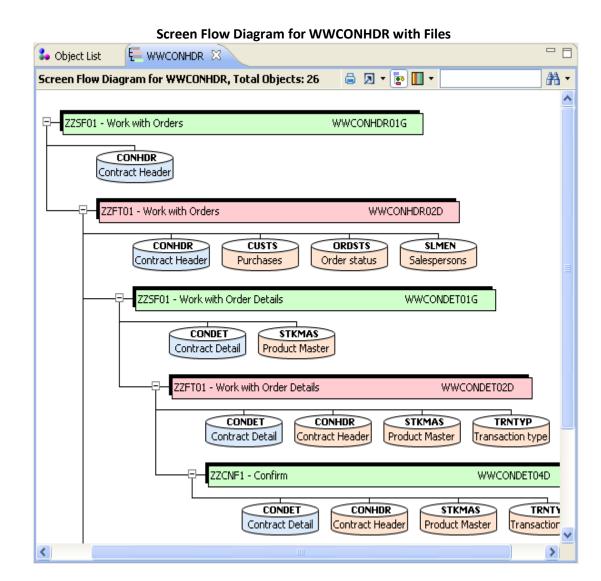
ZZSF01 - Work with Order Details

Show Files icon

Se Object List		
Screen Flow Diagram for WWCONHDR, Total Objects: 7	🖨 🗵 + 📴 🚻 +	AA •
	2	
무— ZZSF01 - Work with Orders	WWCONHDROIS	

When you click on the icon, all the files related to the selected object are displayed, as shown below.





Note: The functions in Screen Flow Diagram suffixed with "G" denote the grid display corresponding to the subfile record format of the display file used in the program. The ones suffixed with "D" represent the screen functions for the flat screen record format of the display file.

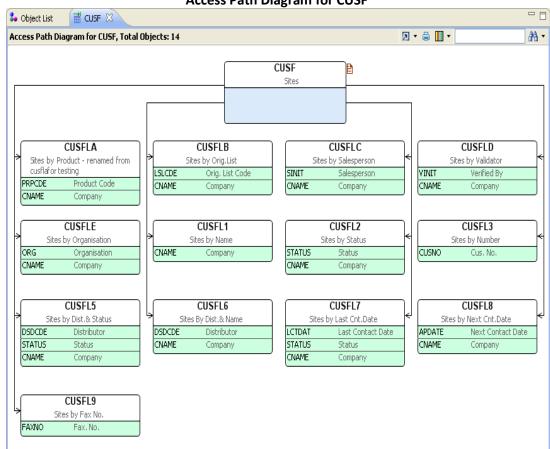
## ACCESS PATH DIAGRAM

The Access Path Diagram is the diagrammatic representation of LFs/Access Paths lists. The LFs/Access Paths displays all the access paths for a selected physical file.

Opt for the context menu on that PF to generate the Access Path Diagram for a PF, and then select the **Access Path Diagram** option.

The following diagram displays the Access Path Diagram for CUSF.





### Access Path Diagram for CUSF

### Legend

The Access Path Diagram Legend displays the following:

- Main This depicts the main object.
- Alternative PID This depicts the alternative Primary Identifier file.

Main
Alternative PID
🗖 Logical File

**Logical File** – This depicts the LF for the selected object.

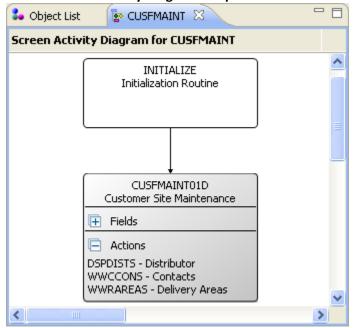
## **SCREEN ACTIVITY DIAGRAM**

The **Screen Activity Diagram** option is available on the context menu of an object. Select this option to study the screen(s) activity of a particular object. Bus-routing block diagrams are used to map the activity of the object. When you select this option, the following diagram appears:



Screen Ac	tivity Diagram – CU	SFMAINT	
🕹 Object List	😰 CUSFMAINT 🛛	-	
Screen Activity	Diagram for CUSFMA	INT	
			^
1	INITIALIZE Initialization Routine		
		J	
		_	
	<b>↓</b>	_	
Cust	CUSFMAINT01D tomer Site Maintenance		
🕂 Fie	lds		
🖽 Ad	tions		
			~
<		>	

Click the H icon to expand the screen and reveal the Fields and the Actions of the object, as displayed underneath:

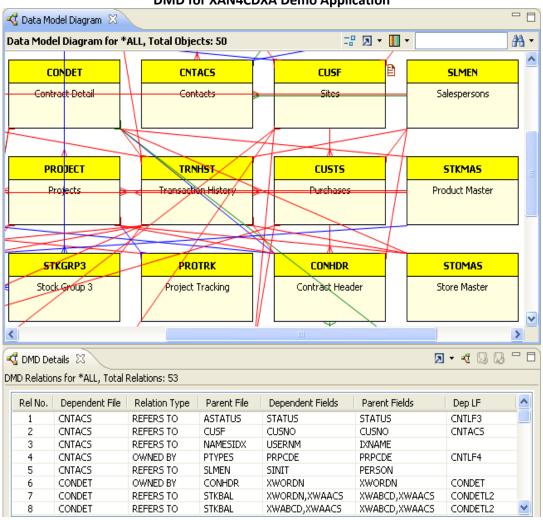


#### Screen Activity Diagram – Expanded view

Note: Generating the Screen Activity Diagram is limited to objects with RPG/RPGLE/CBL/CLP/CLLE attribute.

## **Data Model Diagram**

The Data Model Diagram displays file relationships for a File within the cross-reference library or an application area. The related members are displayed distinctly in yellow, while the external Objects (applicable only in the application area) are displayed in blue.



**DMD for XAN4CDXA Demo Application** 

The File Connection details are displayed in the DMD Details view.

Single-click on a specific object shows the references of that object. Click on **CUSTS** to view its references.



ta Model Diagram for *ALL	., Total Objects: 50			II 🛛 🕶 📗	•
CPYBKSRC	CUSTS	ORDSTS	DISTS	LISTS	ORGS
Cobol copybooks	Purchases	Order status description	Distributors	Lists	Organisations
CONDETNW	TRNTYP	टफ्रम्	NAMESIDX	PTYPES	CUSGRP
Contract Detail new -?CBL Ver. with Long fields	Transaction type description	Sites	Names Index	Products	Customer Groups
ASIMPLTEST	STOMAS	ASTATUS		SLMEN	DELIVA
ASIMPLIEST					
	Store Master	Status file	Contacts	Salespersons	Delivery Areas
		$\backslash$			
TRNHST	STKMAS	STKBAL	CONHDR	CONDET	PROJECT
Transaction History	Product Master	Stock Balances	Contract Header	Contract Detail	Projects

the CLICTC and .

### Legend

The DMD Legend, shown alongside, depicts the relationship type of the object(s).

- Refer To This depicts a relationship where a non-key field of another file is referred.
- **Owned By** This depicts a relationship where the key field of another file is referred.

📕 Refer To

Owned By

Uni-Directional

Multiple Rels

Internal

🔲 External

Extended By

- Uni-Directional This indicates a singular relationship between two objects.
- Multiple Rels This indicates multiple relationships between two objects.
- Internal This depicts the file internal to an application area.
- External This depicts the file external to an application area.
- Extended By This depicts a special kind of Refers to which is seen in Synon applications.

## **GENERATING DMD**

To generate the DMD, expand the Application Library and double-click on the **Data Model Diagram** node. This invokes the **Data Model Diagram** dialog, as shown below.

Data Model Diagram dialog	
Data Model Diagram	x
Application Area: Name Description *NONE  All Members Selected	
Object *ALL Text	
DMD Data Options Display External Relationships Show unrelated files OK Cancel	

It prompts the user to:

- 1. Select the Application Area name, if available; else leave it as *NONE.
- 2. The Object Name on the Object group can be:
  - *ALL (for all Objects)
  - Object Name (maximum 10 characters long).
- 3. **DMD Data Options** to Display External Relationships (for Application Area only) and Show unrelated files.
- 4. Click OK.

The Data Model Diagram node is present under the cross-reference library node and the Application Area nodes.

## **DMD** FOR AN APPLICATION AREA

The DMD can also be generated for an application area. It can be opted either by expanding the application area under the cross-reference library node or by selecting the specific application area name on the **Data Model Diagram** dialog.

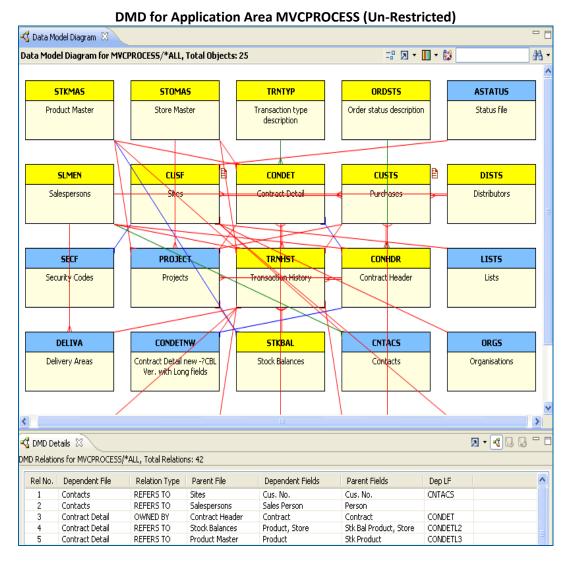
The DMD for an application area is **restricted** to that application area, representing the relationships among the related objects of the application area.

Data Mo	odel Diagram 🛛 🔪					
ta Mod	el Diagram for MV	CPROCESS/*ALL,	Total Objects: 13	IP 🗵 🕇	II - 💓	#
	CUSTS		IDR	STKBAL	ORDSTS	
	Purchases	Contract		Stock Balances	Order status descript	ion
	CONDET	TRN	IST	CU <mark>SF</mark>		
C	iontract Detail	- Transactio	R History	Siltes	Salespersons	
		STON		STKMAS	DISTS	
Tr	ansaction type description	Store M		Product Master	Distributors	
					CUSGRP	
					Customer Groups	
DMD De	tails 🛙				<u> </u>	
	ns for MVCPROCESS,	/*ALL, Total Relation	ns: 22			
Rel No.	Dependent File	Relation Type	Parent File	Dependent Fields	Parent Fields	Dep 🗹
1	Contract Detail	OWNED BY	Contract Header	Contract	Contract	CONE
2	Contract Detail	REFERS TO	Stock Balances	Product, Store	Stk Bal Product, Store	CONE
	Contract Detail	REFERS TO	Product Master	Product	Stk Product	CONE
3	Contract Detail	REFERS TO	Froduct Master	FIODUCC	Derrioddee	CONL

DMD for Application Area MVCPROCESS (Restricted)

The DMD for an application area can be un-restricted by clicking the **Unrestrict To Application Area** icon.





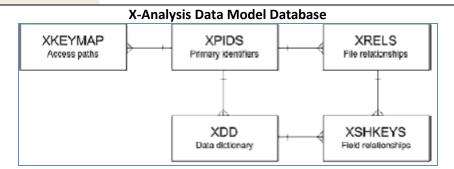
Note: While using the 'Restrict To Application Area' feature, ensure that the originallyselected application area is not changed.

## UNDERSTANDING DATA MODEL DATABASE

The metadata database that underlies X-Analysis is a valuable resource and contains information that can be leveraged for your own purposes.

There are five core tables that are generated by the X-Analysis data modelling process. These tables are listed below.

Feature	Brief Description
XPIDS	Primary identifiers
XDD	Data dictionary
XRELS	Relationships
XSHKEYS	Relationship detail
XKEYMAP	Access paths



The easiest way to view the data in the data model is to use the **Data Dictionary** facility provided within X-Analysis.

- 1. Open the Customer Maintenance System in X-Analysis.
- 2. Click the **Data Dictionary** icon on the toolbar.



## **Options on Screen Components**

X-Analysis is equipped with a set of options that provides you with significant details about the application like source codes, business rules, data content, and other similar information. The following options are covered under the Screen Components feature.

- Screen Source Code
- Function Editor
- Preview Designer
- Page Designer
- Data Content
- Screen Actions
- Class Diagram
- Business Rules
- Component Documenter
- Annotate

## **SCREEN SOURCE CODE**

Select the **Screen Source Code** option to display the source code for the associated display file. A new source browser window will be invoked, displaying the source member of the associated display file.



	Scr	een so		de wind	O VV
🎝 Object List 🛛 🖇	💩 ZZFT01 🛛 👔	CUSTMN	T101D	🖹 🔍 CU	STMNT1FM 🛛 🗖 🗖
Source List of CUS	TMNT1FM in XAN	.DSSRC,	Lines: 23	9, View L	evel: 5 🛛 🔠
🗏 • 🚰 • Щ • I	🧧 📃 i 🗩 🗧	3			
Seq No 🛛 *	.+ 1+	2	+	. з	.+ 4+ 5+.
0013.00	A				VLDCMDKEY (2
0014.00	A				
0015.00	A* Flat So	creen	Mainte	nance l	Format 1
0016.00	A*				
0017.00	A	R ZZ	FT01 🗲		
0018.00	A				TEXT ('Enqui
0019.00	A N94				CA04 (04 'PR
0020.00	A				KEEP
0021.00	A				RTNCSRLOC ( & 🖉
					>
<	_	(a)			2
Screen Componer	nts 🛛			. <b>0</b> € ∎€	≥ □ - R ⊜ ∰ ∎ - 2
<	nts 🛛 or Application Library				
Screen Componer Screen Components fo Program	nts 🛛	XAN4CD		0€ ∎€ DSPF Fo	
Screen Componer	nts 🛛 or Application Library Function	XAN4CD Type I	XA (All) Seq No	DSPF Fo	rmat Physical File Title
Screen Componer creen Components fo Program	nts 🛛 or Application Library Function CUSTMNT101D	XAN4CD Type I R	XA (All) Seq No 12	DSPF Fo	rmat Physical File Title
Screen Componer creen Components fo Program CUSTMNT1	nts 🛛 or Application Library Function	XAN4CD Type I R R	XA (All) Seq No	DSPF Fo	rmat Physical File Title
Screen Componer creen Components fo Program	nts 🛛 or Application Library Function CUSTMNT101D CUSTMNT102D	XAN4CD Type I R R I	XA (All) Seq No 12 13	DSPF Fo ZZFT01 ZZFT02	rmat Physical File Title
Screen Componer Screen Components for Program CUSTMNT1	nts 🛛 or Application Library Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D	XAN4CD Type I R R I R I R	XA (All) Seq No 12 13 8	DSPF Fo ZZFT01 ZZFT02 ZZFT01	rmat Physical File Title
Screen Componer Green Components for Program CUSTMNT1 CUSTMNT1_0	nts 🛛 or Application Library Function CUSTMNT101D CUSTMNT102D	XAN4CD Type I R R I R R R R	XA (All) Seq No 12 13	DSPF Fo ZZFT01 ZZFT02	Image: Screen Source Code
Screen Componer Screen Components for Program CUSTMNT1	nts S Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D	XAN4CD Type I R R I R I R I I	XA (All) Seq No 12 13 8 9	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02	Image: Second Source Code
Screen Componer Green Components for Program CUSTMNT1 CUSTMNT1_0	nts S Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D CUSTMNT1_101D	XAN4CD Type I R R I R I R I R I R	XA (All) Seq No 12 13 8 9 8	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT02	Image: Content
Screen Components for Program CUSTMNT1 CUSTMNT1_0 CUSTMNT1_1	nts S Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D	XAN4CD Type I R R I R I R I R I R R R R	XA (All) Seq No 12 13 8 9	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02	Image: Screen Actions
Screen Components for Program CUSTMNT1	nts 🛛 Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D CUSTMNT1_101D CUSTMNT1_101D CUSTMNT1_102D	XAN4CD Type I R R I R R I R I R I I I I	XA (All) Seq No 12 13 8 9 8 9 9	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT01 ZZFT01 ZZFT02	Image: Screen Source Code   Image: Scre
Screen Components for Program CUSTMNT1 CUSTMNT1_0 CUSTMNT1_1	Application Library Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D CUSTMNT1_101D CUSTMNT1_102D CUSTMNT1_102D CUSTMNT1_102D CUSTMNT1_201D	XAN4CD Type I R R I R I R I R I R R R R	XA (All) Seq No 12 13 8 9 8	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT02	Image: Screen Actions
Screen Components for Program CUSTMNT1 CUSTMNT1_0 CUSTMNT1_1	nts 🛛 Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D CUSTMNT1_101D CUSTMNT1_101D CUSTMNT1_102D	XAN4CD Type I R R I R R I R I R I R I R R	XA (All) Seq No 12 13 8 9 8 9 8 9 8 9	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT01 ZZFT01	Image: Screen Source Code   Image: Scre
Screen Components for Program CUSTMNT1 CUSTMNT1_0 CUSTMNT1_1 CUSTMNT1_1 CUSTMNT1_1 CUSTMNT1_2 CUSTMNT1_2	Application Library Function CUSTMNT101D CUSTMNT102D CUSTMNT1_001D CUSTMNT1_002D CUSTMNT1_101D CUSTMNT1_102D CUSTMNT1_102D CUSTMNT1_102D CUSTMNT1_201D	XAN4CD Type I R R I R R I R I R I R I R I R R I R R I R R	XA (All) Seq No 12 13 8 9 8 9 8 9 8 9	DSPF Fo ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT01 ZZFT02 ZZFT01 ZZFT01	Image: Screen Source Code   Image: Scre

## **FUNCTION EDITOR**

The Function Editor option allows you to modify a given function. Right-click over a selected Screen Component for the context menu, as shown below:

		unctio		roption						
🔠 Screen Componen	ts 🛿	R	🔛 🔬 🛙	t 📢 🛋	🖎 🕄 • 💺 🚮 🛗 🖨 🗵 • 🗆 🗖					
Screen Components for Application Library XAN4CDXA (All)										
Program	Function	Туре	Seq No	DSPF Fo	rmat   Physical File   Title 🛛 🔥					
CUSTMNT1		I								
	CUSTMNT101D	R	4	ZZFT01						
	CUSTMNT102D	R	5	ZZFT02	🖹 🔍 Screen Source Code					
<pre>CUSTMNT1_R</pre>		I			💑 Function Editor					
	CUSTMNT1_R01D	R	1	ZZFT01	2 March 1997					
	CUSTMNT1_R02D	R	2	ZZFT02	🔀 Preview Designer					
CUSTMNT1_0		I			🔣 Page Designer					
	CUSTMNT1_001D	R	4	ZZFT01	0 Data Content					
	CUSTMNT1_002D	R	5	ZZFT02	E Screen Actions					
CUSTMNT1_1		I			~					
	CUSTMNT1_101D	R	4	ZZFT01	Class Diagram					
	CUSTMNT1_102D	R	5	ZZFT02	📴 Business Rules					
CUSTMNT1_2		I			W Courses Desure the					
	CUSTMNT1_201D	R	4	ZZFT01	Component Documenter					
<					Annotate					

**Function Editor option** 

Select the **Function Editor** option to invoke the following window:

ZFT01 - Screen Edito	r - CUSTMNT101D 🖪 🕨 🔀 🔣 🗎 (	19 🗗 🗗 🛅 🤅	18 <b>1</b> 8 🗵 -	′ 🖨 📃 🔤	#A	1
File/Field/Action	Label	Line	Column	Attribute/Type	Parameters	ŀ
🛛 Files						
CUSTS	Purchases					
DISTS	Distributors					
SLMEN	Salespersons					
CUSGRP	Customer Groups					Į
Fields						
ZZPGM	Databorough Ltd.	2	2	Output		
ZZDATE		3	70	Output		
XWBCCD	Customer No	5	22	Both		
XWG4TX	Customer Name	6	22	Both		
XWB2CD	Statement Account .	7	22	Both		
XWB3CD	Related Account	8	22	Both		
XWHITX	Tax Reg	9	22	Both		
XWEONB	Bank	10	22	Both		
XWJUNO	Bank A/c	11	22	Both		

#### **Function Editor window**

Select a particular field, and right-click over it for the context menu. The context menu will display the **Properties** option as shown below:



		Properties of	option				
Object List	💑 ZZFTO1 🛛					1	
ZFT01 - Screen	Editor - CUSTMNT101	D 🖪 🕨 🎘 🖳 🗎 😡	🗿 🗘 📷	i 📲 🛋 🛛	1 • 🖨	(	A
File/Field/Action		Label	Line	Column	Attribute/Type	Parameters	
🗉 Files							_
CUSTS		Purchases					
DISTS		Distributors					
SLMEN		Salespersons					
CUSGRP		Customer Groups					
🖃 Fields							
ZZPGM		Databorough Ltd.	2	2	Output		
ZZDATE			3	70	Output		
XWBCCD	¶≣ Properties	Customer No	5	22	Both		
XWG4TX		Customer Name	6	22	Both		
XWB2CD	🤹 Reassign Field	Statement Account .	7	22	Both		
XWB3CD	💢 Delete	Related Account	8	22	Both		
XWHITX		Tax Reg	9	22	Both		
XWEONB		Bank	10	22	Both		
XWJUNO		Bank A/c	11	22	Both		
:							>

Click this option to invoke the following dialog. You can make the necessary modifications in this.

		Troperties diale	8		
ECUSTS.XWBCCD	- Properties				×
Basic					
Data Type 🛛 🗛	Field Type	Length	11	Decimal Position	0
<ul> <li>Advanced Properties</li> </ul>	s				
Label					
Row 5 Colu	umn 2	ColorId BLK	🖌 Label	Customer No	
Others					
Row	5	Column	22	ColorId BLK	~
Attribute	Both 💌	Display Length	11	EditCode	~
Currency Symbols	~			Date Format	~
Code Field	N (Default)	~		Blank Not Allowed	
Field Processing	* (Default)	~		Yes No Field	
Total Field		~		Check Blank Entries	
					Cancel

**Properties dialog** 

## **PREVIEW DESIGNER**

The Preview Designer option is the outline of the Page Designer. Use the options in the Preview Designer window to make changes such as adding constants, or modifying page layout.

After the changes are applied, they subsequently show up on the Page Designer window.

Preview Designer option										
Screen Components for Application Library XAN4CDXA (All)										
Program	Function	Туре	Seq No	DSPF Fo	rmat 🛛 Physical File 🚽 Title 📃 🔼					
CUSTMNT1		I								
	CUSTMNT101D	R	12	ZZFT01	🖹 🛛 Screen Source Code					
	CUSTMNT102D	R	13	ZZFT02						
CUSTMNT1_0		I			💑 Function Editor					
	CUSTMNT1_001D	R	8	ZZFT01	Preview Designer					
	CUSTMNT1_002D	R	9	ZZFT02						
CUSTMNT1_1		I			R Page Designer					
	CUSTMNT1_101D	R	8	ZZFT01	0 Data Content					
	CUSTMNT1_102D	R	9	ZZFT02	E Screen Actions					
CUSTMNT1_2		I			🖳 Class Diagram					
	CUSTMNT1_201D	R	8	ZZFT01	Business Rules					
	CUSTMNT1_202D	R	9	ZZFT02						
CUSTMNT1R		I			🚡 Component Documenter					
	CUSTMNT1R01D	R	1	ZZFT01	V					
<					Annotate					

Right-click on a Screen Component for the context menu and select the Preview Designer option to invoke the following window:



		Preview Designer window	
🎝 Ob	oject List 🛛 💑 ZZFT01		- 8
CUS	TMNT101D - Screen De	sign	44 dd 🚵 🧱 🔣 🖏
Cust	tomer Detail Maintenan	ce	
	••••1••••2••••1••••4•		14 16 1
:	Customers	Customer Detail Maintenance	Databorough Ltd.
			>
:	Customer No		
	Customer Name		
	Statement Account .		
	Related Account		
	Tax Reg		
: 1	Bank		
	Bank A/c	Forex	
	CusGrp>		
: 1	Rep >		
: 1	Distributor >		
» - -	Credit Limit	Terms	
	Sti Dsc	Int	
	Cr Guarantee, , , ,		_
	B/O	Lang	
:	Date Loaded	Chg-Date	
·   1	Last Sale		
	Cancel Submit		

## **PAGE DESIGNER**

X-Analysis allows you the access to two versions of page design via the **Page Designer** option. Set the option on the **X-Redo Advanced Preferences** window (refer to the image below). The default option to edit the selected page is Eclipse.



	X-F	edo Advanced Preferences window	
•		Preferences	- 🗆 🗙
type filter text		Advanced	<b>⇔</b> ▼ ⇒ ▼
<ul> <li>Run/Debug</li> <li>Server Service Policies</li> <li>Tasks</li> <li>Team</li> <li>Tomcat</li> <li>UML2 Diagrams</li> <li>Usage Data Collector Validation</li> <li>Web</li> <li>Web</li> <li>Web Services</li> <li>X-Analysis Advanced Folders General X-Data Test</li> <li>X-Redo Advanced</li> <li>XDoclet</li> <li>XML</li> </ul>	~	Advanced X-Redo Preferences.  Page Designer Design Page using Generate WAR/EAR Generate Separate UserLogicClass Generate Java to use with Other Databases Suppress try/catch Statements in Logic Classes Restore I	Eclipse v Defaults Apply
0		OK	Cancel

Alternatively, you can edit page/s using Dreamweaver. If Dreamweaver is installed on your machine, then the drop-down will show it as an option. After setting the Page Designer preference as Dreamweaver in the **X-Redo Advanced Preferences** window, restart the X-Analysis plugin to invoke Adobe's Dreamweaver software for designing a web page.

<b>\$</b>		Preferences	- 🗆 🗙
type filter text		Advanced	← ▼ ⇒ ▼ ▼
Team Usage Data Collector Validation Web Web Services X-Analysis Advanced Folders General X-Data Test X-Redo Advanced	^	Advanced X-Redo Preferences. Page Designer Design Page using Generate WAR/EAR Generate Separate UserLogicC Generate Java to use with Othe Suppress try/catch Statements	er Databases
XDoclet XML	~	Restore Defa	ults Apply
0		ОК	Cancel

Dreamweaver option – X-Redo Advanced Preferences window

Right-click on a Screen Component for the context menu and select the Page Designer option, as displayed underneath:

	Page Des	signer	option -	- Contex	kt menu					
🖀 Screen Components 🛛 💦 🔣 🧏 👷 🗮 🐗 🗮 🖓 🔻 着 🗟 🗩 🗸 🖓										
Screen Components fo	r Application Library 3	(AN4CD)	(A (All)							
Program	Function	Туре	Seq No	DSPF For	rmat 🛛 Physical File 🚽 Title 🔄 🗖					
CUSTMNT1		Ι								
	CUSTMNT101D	R	12	ZZFT01	🖹 🗙 Screen Source Code					
	CUSTMNT102D	R	13	ZZFT02						
CUSTMNT1_0		I			💑 Function Editor					
	CUSTMNT1_001D	R	8	ZZFT01	🗵 Preview Designer					
	CUSTMNT1_002D	R	9	ZZFT02						
CUSTMNT1_1		I			Rege Designer					
	CUSTMNT1_101D	R	8	ZZFT01	0뚢 Data Content					
	CUSTMNT1_102D	R	9	ZZFT02	E Screen Actions					
CUSTMNT1_2		I			🖳 Class Diagram					
	CUSTMNT1_201D	R	8	ZZFT01	Business Rules					
	CUSTMNT1_202D	R	9	ZZFT02						
CUSTMNT1R		I			🕌 Component Documenter					
	CUSTMNT1R01D	R	1	ZZFT01	Annotate					
<										

The following screenshot displays the Page Designer window in the Eclipse mode:

omer Detail Maintenan	ce
Customers	Customer Detail Maintenance
Databorough Ltd	
-	
Customer No	
Customer Name	
Statement Account	
Related Account	
Tax Reg	
Bank	
Bank A/c	Forex
CusGrp	V
Rep	
Distributor	
Credit Limit	Terms
StI Dsc	Int
Cr Guarantee	
B/O	Lang
Date Loaded	Chg-Date
Last Sale	

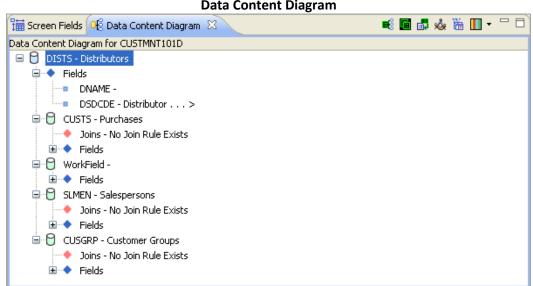
Page Designer window

## **DATA CONTENT**

Select the Data Content option to access further relevant details of a particular file. The option is available for all Screen Components and Development Screens. Right-click on a Screen Component for the context menu and select the Data Content option, as shown below:

(D)			Content	•	<b>D D</b>	51 m m 134		
🖀 Screen Componen				્ય, ખાર ■ર	194, <u>[</u> ]	3 - 💺 🚮 🛗		
Screen Components fo	r Application Library >	(AN4CD)	(All)					
Program	Function	Туре	Seq No	DSPF For	rmat	Physical File	Title	^
CUSTMNT1		I						
	CUSTMNT101D	R	12	ZZFT01		Screen Source Co	nde	
	CUSTMNT102D	R	13	ZZFT02				_ 🗏
CUSTMNT1_0		I			ا 💑 ا	Function Editor		
	CUSTMNT1_001D	R	8	ZZFT01		Preview Designer		
	CUSTMNT1_002D	R	9	ZZFT02				
CUSTMNT1_1		I				Page Designer		-11
	CUSTMNT1_101D	R	8	ZZFT01	∎t:	Data Content		
	CUSTMNT1_102D	R	9	ZZFT02	<b>⊞</b> §:	Screen Actions		
CUSTMNT1_2		Ι				Class Diagram		
	CUSTMNT1_201D	R	8	ZZFT01		Business Rules		
	CUSTMNT1_202D	R	9	ZZFT02		Dusiness Rules		-11
CUSTMNT1R		I			W	Component Docu	menter	
	CUSTMNT1R01D	R	1	ZZFT01		Annotate		~
<					E	Annotate		

The Data Content Diagram generated for a screen uses the model information to depict the primary file in use by that screen shown in blue. The sub-node is the secondary file (in green) with which the primary file joins to pull the additional information to show on the screen. The sub-node splits into two parts. The first part displays Joins - lists the field(s) from the secondary file facilitating the file join; the second part displays Fields - lists the field(s) from the primary file.



#### **Data Content Diagram**

## **SCREEN ACTIONS**

The Screen Actions Diagram presents the actions allowed on the screen. The actions could be:

- Prompt Action To look up for the possible values for a field, facilitated by the join on the secondary/foreign file.
- Submit Action Usually on the record screen or a form, which submits the data for validation and moves on.
- Navigation Action To branch off to a new screen. Usually on the grids or record screens being viewed in the display mode.

Right-click for the context menu over a selected Screen Component and select the **Screen Actions** option, as shown below:

		Screen	Actions	option		
🔚 Screen Componen	ts 🛿	×	🔛 💩 🗉	l 🛯 🛋	Ba 🕄 🕶 🖫 🚮 🛗 🖨 🗵 🕶 🗖	E
creen Components fo	r Application Library (	XAN4CD>	(A (All)			
Program	Function	Туре	Seq No	DSPF Fo	rmat Physical File Title	^
CUSTMNT1		I				
	CUSTMNT101D	R	12	ZZFT01	Creen Source Code	
	CUSTMNT102D	R	13	ZZFT02		
CUSTMNT1_0		I			💑 Function Editor	
	CUSTMNT1_001D	R	8	ZZFT01	Preview Designer	
	CUSTMNT1_002D	R	9	ZZFT02		
CUSTMNT1_1		I			Rage Designer	
	CUSTMNT1_101D	R	8	ZZFT01	0 Data Content	
	CUSTMNT1_102D	R	9	ZZFT02	Screen Actions	
CUSTMNT1_2		I			🖳 Class Diagram	
	CUSTMNT1_201D	R	8	ZZFT01		
	CUSTMNT1_202D	R	9	ZZFT02	🛱 Business Rules	
CUSTMNT1R		I			Hand Component Documenter	
	CUSTMNT1R01D	R	1	ZZFT01		١
<					Annotate	

#### Screen Actions option

The **Screen Actions** option is available for all Screen Components and Development Screens.



Screen Action Diagram						
🖀 Screen Components 🕞 Data Content Diagram 🖷 Screen Action Diagram 🔀						3
Screen Action Diagram for WWCONHDR01G	œ	i.	d,	ŵ	ħ	•
Work with Orders - WWCONHDR01G (ZZSF01)						
🖨 🗖 Change - WWCONHDR02D (ZZFT01)						
SWBCCD - WorkField						
🖨 🗖 Delete - WWCONHDR02D (ZZFT01)						
SWBCCD - WorkField						
🖨 🗖 Display - WWCONHDR02D (ZZFT01)						
SWBCCD - WorkField						

## **CLASS DIAGRAM**

Select the **Class Diagram** option to generate the UML class diagram. Right-click for the context menu on a Screen Component and select the **Class Diagram** option. :

~			Diagram	•	
🚰 Screen Componen	its 🛛	R	🔛 🔌 🗉	1, 0-6 <b>-</b> 6 I	🔌 🕄 • 🖫 📠 🐻 🖨 🗩 • 🗆 🗖
5creen Components fo	or Application Library (	XAN4CD>	(All)		
Program	Function	Туре	Seq No	DSPF Forr	mat 🛛 Physical File 🚽 Title 🛛 🔥
CUSTMNT1		I			
	CUSTMNT101D	R	12	ZZFT01	📄 Screen Source Code
	CUSTMNT102D	R	13	ZZFT02	
CUSTMNT1_0		I			💑 Function Editor
	CUSTMNT1_001D	R	8	ZZFT01	🖳 Preview Designer
	CUSTMNT1_002D	R	9	ZZFT02	Rage Designer
CUSTMNT1_1		I			
	CUSTMNT1_101D	R	8	ZZFT01	0fg Data Content
	CUSTMNT1_102D	R	9	ZZFT02	E Screen Actions
CUSTMNT1_2		I			🖫 Class Diagram
	CUSTMNT1_201D	R	8	ZZFT01	Business Rules
	CUSTMNT1_202D	R	9	ZZFT02	
CUSTMNT1R		I			Component Documenter
	CUSTMNT1R01D	R	1	ZZFT01	
<					E Annotate

The **Class Diagram** option is available for all Screen Components and Development Screens.

	Class Diagram	
CUSTMNT1FM	👔 CUSTMNT101D-classdiagram.umlclass 🛛	
Package	«Table» <b>Distributors</b> ▼ attributes -description : String -code : String	
<u>&lt;</u>	✓ operations ✓ classes	>

## **BUSINESS RULES**

Business rules are defined as discrete blocks of program logic gathered during the design recovery process, which describe data processes that are independent of both the data model and the environment. The rule narration too is held along with the rule for better understanding.

Right-click for the context menu on a Screen Component and select the **Business Rules** option, as shown below:

		Susine	ss Rules	option	
🟪 Screen Componen	ts 🛛	R	🔛 💩 🗉	. 🕫 🛋	i 🖎 📴 • 💺 🚮 🛗 🖨 🗩 • 🗖 🗖
icreen Components fo	r Application Library >	(AN4CD)	(A (All)		
Program	Function	Туре	Seq No	DSPF Fo	ormat 🛛 Physical File 🚽 Title 📃 🗖
CUSTMNT1		I			
	CUSTMNT101D	R	12	ZZFT01	📄 🖉 Screen Source Code
	CUSTMNT102D	R	13	ZZFT02	
CUSTMNT1_0		I			💑 Function Editor
	CUSTMNT1_001D	R	8	ZZFT01	🔀 Preview Designer
	CUSTMNT1_002D	R	9	ZZFT02	
CUSTMNT1_1		I			R Page Designer
	CUSTMNT1_101D	R	8	ZZFT01	다음 Data Content
	CUSTMNT1_102D	R	9	ZZFT02	E Screen Actions
CUSTMNT1_2		I			🖳 Class Diagram
	CUSTMNT1_201D	R	8	ZZFT01	
	CUSTMNT1_202D	R	9	ZZFT02	Business Rules
CUSTMNT1R		I			Component Documenter
	CUSTMNT1R01D	R	1	ZZFT01	
<					Annotate

**Business Rules option** 

The business rules for the source member will get listed. The business rules are listed only when the **Derive Business Rules** option has already been opted on the source member.



			Busine	ss Rules	
📕 Business Rules	🛛 🖀 Scre	en Compone	ents	Tu Te T 🖨 🗵 🕶 🛄 🕶 🐺 🗂	1
Business Rules for	function CUSTN	/INT101D, Nu	mber of Lin	es: 13	
Source Member	Rule Number	Field	File	Rule	1
CUSTMNT1	00001	XWBCCD	CUSTS	Debtor = blank	1
CUSTMNT1	00002	XWG4TX	CUSTS	Name = blank	
CUSTMNT1	00003	XWBNCD	CUSTS	End of file on CUSGRP and CUSGRP.CusGrp <> blank	
CUSTMNT1	00004	PERSON	CUSTS	Rep not found on Salespersons	
CUSTMNT1	00005	DSDCDE	CUSTS	Distributor not found on Distributors	
CUSTMNT1	00006	XWGIVA	CUSTS	Credit_Limit < 0	
CUSTMNT1	00007	CUSNO	CUSTS	Cus_No = 0	
CUSTMNT1	80000	CUSNO	CUSTS	Cus_No not found on Sites	
CUSTMNT1	00009	XWBCCD	CUSTS	Debtor found on Purchases	
<				>	

## **COMPONENT DOCUMENTER**

The **Component Documenter** option documents the extracted Screen Components (Reengineered Functions). The following information is documented:

- Additional Header Info This includes the function header information.
- Data Content This includes the data content diagram.
- Screen Actions This includes the screen action diagram.
- Screen Design This includes the Screen Design for all formats.
- Residual Logic This includes the business process logic for the selected screen component.
- Business Rules This includes the business rules for the selected screen component.



	Comp	onent	Docum	enter op	tion			
Screen Componen	ts 🛛	R	🔛 💩 🛙	<b>.</b>	Bq. 🗄	] - 💺 🚜 🛗	ê 🛛 •	
creen Components fo	r Application Library 3	XAN4CD>	(A (All)					
Program	Function	Туре	Seq No	DSPF Fo	rmat	Physical File	Title	^
CUSTMNT1		I						
	CUSTMNT101D	R	12	ZZFT01		Screen Source Co	nde	
	CUSTMNT102D	R	13	ZZFT02	<u> </u>			_ =
CUSTMNT1_0		I			💑 F	unction Editor		
	CUSTMNT1_001D	R	8	ZZFT01		Preview Designer		
	CUSTMNT1_002D	R	9	ZZFT02	-	-		
CUSTMNT1_1		Ι				^p age Designer		
	CUSTMNT1_101D	R	8	ZZFT01	0-€ C	Data Content		
	CUSTMNT1_102D	R	9	ZZFT02	∎€SS	Screen Actions		
CUSTMNT1_2		I			昆	Ilass Diagram		
	CUSTMNT1_201D	R	8	ZZFT01				
	CUSTMNT1_202D	R	9	ZZFT02		Business Rules		- 1
CUSTMNT1R		Ι			100 0	Component Docu	menter	
	CUSTMNT1R01D	R	1	ZZFT01				
<						Annotate		

For more details, refer to Appendix C.

### **ANNOTATE**

The **Annotate** option is available to provide annotates to a specific function. Right-click on a Screen Component for the context menu and select the **Annotate** option, as displayed underneath:

		Ann	otate op	otion				
🔠 Screen Componen	ts 🛛	R	🔛 🎪 🛙	. 🥰 🛋	Bk B	2 - 🖫 🚜 🛗	8 🛛	
Screen Components fa	r Application Library (	XAN4CD>	(All)					
Program	Function	Туре	Seq No	DSPF Fo	rmat	Physical File	Title	^
CUSTMNT1		I						
	CUSTMNT101D	R	12	ZZFT01		Screen Source Ca		
	CUSTMNT102D	R	13	ZZFT02				
CUSTMNT1_0		I			💑 I	unction Editor		
	CUSTMNT1_001D	R	8	ZZFT01		Preview Designer		- 1
	CUSTMNT1_002D	R	9	ZZFT02	1			- 1
CUSTMNT1_1		I			1	^o age Designer		- 1
	CUSTMNT1_101D	R	8	ZZFT01	<b>0-</b> € 1	Data Content		- 1
	CUSTMNT1_102D	R	9	ZZFT02	∎₿	Screen Actions		- 1
CUSTMNT1_2		I				Class Diagram		- 1
	CUSTMNT1_201D	R	8	ZZFT01				- 1
	CUSTMNT1_202D	R	9	ZZFT02	<b>≣</b> ₽ 1	Business Rules		- 1
CUSTMNT1R		I			¥ o	Component Docu	menter	
16	CUSTMNT1R01D	R	1	ZZFT01				
<					E	Annotate		

The following dialog box is invoked in which you can write notes. Subsequently, click the related buttons to **Save**, **Delete**, or **Cancel** annotates.



Annotation for CUSTMNT101D	×
Additional Notes	
	V
	Save Delete Cancel

## **DEVELOPMENT SCREENS**

X-Analysis provides the following options on Development Screens:





	Options availab	le un Develu	phient screens List	
🔚 Development (	Screens 🛛		🎪 🔍 46 🛋 🏪 📾 🗵 🗸 🗖	' 🗆
evelopment Scree	ens List of *NONE/*ALL/*ALL			
Function		Physical File	Title	^
AAASTATUS	A contraction	ASTATUS	Status file	
AACNTACS	💑 Function Editor	CNTACS	Contacts	
AACONDET	🔃 Preview Designer	CONDET	Contract Detail	
AACONDETNW	Rage Designer	CONDETNW	Contract Detail new -?CBL Ver. with Long fields	
AACONHDR		CONHDR	Contract Header	
AACUSE	📲 Data Content	CUSF	Sites	
AACUSGRP	EScreen Actions	CUSGRP	Customer Groups	
AACUSTS	Class Diseven	CUSTS	Purchases	
AADELIVA	Class Diagram	DELIVA	Delivery Areas	
AADISTS	📊 Business Rules	DISTS	Distributors	
AAEVFEVENT		EVFEVENT	File: EVFEVENT	*
<			>	

**Options available on Development Screens List** 

All these options available on Development Screens are already discussed under the Screen Components section.

# **Business Rules Analysis**

Fresche Legacy's Business Rules Extraction software, **X-Rules**, can be used to highlight the business rules within a source member using X-Analysis. Using **X-Rules**, the business logic may be identified and narrated from individual programs or parts of the entire system. This business logic, thus extracted, is analyzed and documented using the various related features of X-Analysis.

The Business Rules of an application are what makes the application function uniquely. While X-Analysis can expose the Business Rules implicit in the data and process models of an application, this does not entirely account for the vast amount of business logic that is buried inside the source code of the programs.

X-Rules is capable of identifying and narrating this logic automatically from individual programs or parts of the entire system. The business rules logic can then be analyzed and documented with the powerful and interactive source browser integrated with X-Analysis.

## **BUSINESS RULES**

The program source is grouped into discrete blocks of logic so that each block represents a particular execution of a business rule. This block of code is then converted into 'Pseudo Code' that describes the execution of the logic. Literals and constants are liberally used in the narration, wherever possible, giving very accurate descriptions of the logic. Each rule has an exclusive identifier that makes system-wide analysis and documentation of business rules possible in X-Analysis.

The entire process is achieved by invoking a single command on X-Analysis. The business rules generation process identifies the various components of the business rules and writes them to either:

- 1. A new source member or
- 2. An index over the original source member.

#### X-Analysis can display business rules automatically using the generated index.

X-Rules not only identifies the Business Rules Logic, but also generates a prototype application for a part of the original application.

X-Rules uses the X-Analysis cross-reference database and the original application program source code to provide shadow programs for the functions in the prototype application. These shadow programs contain all the business rules logic from the original programs. These rules include all field validation that is additional to the normal database integrity checks (which are generated automatically), calls to batch programs for additional functions, and secondary file processing. The primary criteria to track Business Rules are the presence of CAS, COMP, IF, ELSEIF, and WHEN statements.

For the secondary criteria, the following are specified:

- The condition involves one or more database fields.
- The condition contains the screen fields which get tracked to the database fields.
- The condition involves the %EQUAL, %FOUND, %EOF built-in functions.
- The condition contains the resulting indicators for the database I/O operations (analogous to %EQUAL, %FOUND, and %EOF built-in functions).
- The presence of the conditioning indicators for some other operation codes (e.g. CHECK, SCAN, LOOKUP).

Based on the above specifications, the recovered logic contains the following business rules components:

- Field Validations
- Calls to other (significant) programs
- Secondary (database) file updates
- Non-owner file reads

## **DERIVE BUSINESS RULES**

This option is available on the context menu of a cross-reference library and an application area. The Business Rules may only be generated for RPG, RPGLE, and CBL objects (*PGM type).

The **Derive Business Rules** option on an individual program calls the **XBIZRULES** command. This command uses the X-Analysis databases to re-engineer all relevant functionality from a legacy program.

The extracted code comprises the following:

- Validations
- Batch Program Calls
- Secondary File Updates
- Non-owner File reads



The **Derive Business Rules** option on an individual ***PGM** object invokes the following dialog:

Derive Busines	s Rules dialog
🖨 Derive Bus. Ru	le 🛛
Source Member	CNTCMAINT
Source File	QRPGLESRC
Source Library	XAN4CDEM
Source Type	RPGLE
X-Rev Library	XAN4CDXA
X-Analysis Lib	*XRLIB
ок	Cancel

The process involves identifying certain key components of the program, including message statements, return codes, and validation flags. Then, the significant update files are identified. After the process is over, the program is scanned for statements which represent any of the above logic types. These statements are written to the file **XEXTRGLINS** – the "Trigger Lines" file, which is then used to produce the required output.

The **Derive Business Rules** option for the entire application or a single application area calls the **XGENBRULES** command.

🖨 Derive Business Rules 🛛 🔀					
X-Ref Library	XAN4CDXA				
X-Rev Library	*XALIB				
Application Area	MVCPROCESS				
OK	Cancel				

#### Derive Business Rules dialog on an Application Area

This command will identify the business rules logic in each program in the application over which the specified cross-reference database has been built. A source member containing the business rules logic and narrative describing each rule is generated for each program. This is achieved by invoking the **XBIZRULES** X-Model command for each program in the application.

## **VIEW BUSINESS RULES**

X-Analysis can display Business Rules automatically using the generated index.

X-Analysis allows the display of the source member for any program in the application. When the source member is displayed, click the **Source Options** drop-down menu and select **Business Rules** to see the business rules logic highlighted within the member. You can immediately see the business logic within the context of the program as a whole.

	Source Code o	of CUSFMAIN	T		
🕹 Object List 🛛 🖹 🔍 CUSFN	IAINT 🛛				
Source List of CUSFMAINT i	n XAN4CDEM/QRPGLESRC	, Lines: 330, Vi	ew Level: 5		待 -
🗏 • 🗈 🔂 🖪 🕄 • 🗭 •	· 💵 - 📴 - % 🖬 📃	i 🗵 - 🖨 😋	-		
✓ Normal Source Code	. 1+ 2	+ 3	+ 4+.	5+	🔼
Indented Source Code	****	* * * * * * * * * *	******	*****	***
Business Rules Overlay	Mainline	Code			
Business Rules	******	********	*********	********	***
Consolidated Rules が	Retrieve record				
Business Process Logic	cusno	chain(e)	rcusf		
0059.00 C	e	if	not %found	l(cusf13)	
0060.00 C		eval	*inlr = *o	n	~
<					>

The following window is invoked:



	/	Busines	s Rules	for CUSFMAINT
la Programs	🗟 CUSFMAIN	ा छ 🔪		- [
Business Rules fo	r CUSFMAINT i	n XAN4CD	EM/QRP	GLESRC, View Level: 1 🔠 🔠
🗏 🔻 🖪 👻 🗄	🗗 🔻 💵 🔻 🐼	% 🖻 📃	🛛 🔻 🧯	) Bq -
Business Rule	3			1
MAINLINE				
// M a	ainline	e Cod	l e	
R0000:	1 Cus_No not	found on	Sites	
11	Retrieve red	cord		
Read	data rcusf u	using cus	no	
	ot Found(cusf	E13)		
	ulr = *on			
	TURN			
END				
	t screen valu			
	til Exit/Cano	cei		> >
📮 Business Rules	🛛 🔪 🛗 Scre	en Compo	nents	Tu Te T 🖨 🗵 🕶 🛄 🖛 🗮
Business Rules for	CUSFMAINT, N	umber of Li	nes: 10	
Source Member	Rule Number	Field	File	Rule
CUSFMAINT	00001	CUSNO	CUSF	Cus_No not found on Sites
CUSFMAINT	00002	CNAME	CUSF	Company = blank
	00003	TELNO	CUSE	
CUSFMAINT	00003	TEENO	CUSE	Phone <> blank
	00004	FAXNO		Phone <> blank Fax_No <> blank
CUSFMAINT			CUSF	
CUSFMAINT	00004	FAXNO	CUSF CUSF	Fax_No <> blank Distributor <> blank
CUSFMAINT CUSFMAINT CUSFMAINT	00004 00005	FAXNO DSDCDE DSDCDE	CUSF CUSF CUSF	Fax_No <> blank Distributor <> blank
CUSFMAINT CUSFMAINT CUSFMAINT CUSFMAINT	00004 00005 00006	FAXNO DSDCDE DSDCDE STATUS	CUSF CUSF CUSF CUSF	Fax_No <> blank Distributor <> blank Exact match not found for Distributor on Distributo
CUSFMAINT CUSFMAINT CUSFMAINT CUSFMAINT	00004 00005 00006 00007	FAXNO DSDCDE DSDCDE STATUS	CUSF CUSF CUSF CUSF	Fax_No <> blank Distributor <> blank Exact match not found for Distributor on Distributo Sts <> blank

The Business Rules view also displays columns for Error Message, Business Rule Annotation, Rule Status, and Rule Status Comment. The columns can be seen in the image underneath.

Dusiness nuies wind			
🛱 Business Rules 🛛		Tu Te T 🖨 🗵 🔻	🚺 🛨 📑 🗖 🗖
Business Rules for CUSFMAINT, Number of Line	es: 10		
Message ID	Rule Status	Rule Status Comment	Annotation
	No Status		
OEM0012 (You must enter the customer na	No Status		
OEM0014 (The telephone no. is invalid.)	No Status		
OEM0015 (The fax. no. is invalid.)	No Status		
	No Status		
OEM0018 (The distributor is invalid.)	No Status		
OEM0019 (The status is invalid.)	No Status		
OEM0020 (You must enter a contact name.)	No Status		
OEM0021 (The title is invalid.)	No Status		
	No Status		
<			2

Business Rules window showing the new columns

The **Configure Columns** feature in the Business Rules view helps you manage the columns displayed. You can reduce the width or hide any column by setting width to 0.

usiness Rules for	CUSFMAINT, N	umber of Li	nes: 10		😂 Configure C 🚽 🗖 🔜 🗶
Source Member	Rule Number	Field	File	Rule	
CUSFMAINT	00001	CUSNO	CUSF	Cus_No no	Source Member
CUSFMAINT	00002	CNAME	CUSF	Company	Rule Number
CUSFMAINT	00003	TELNO	CUSF	Phone <>	Field
CUSFMAINT	00004	FAXNO	CUSF	Fax_No <>	File
CUSFMAINT	00005	DSDCDE	CUSF	Distributor	
CUSFMAINT	00006	DSDCDE	CUSF	Exact mate	Message ID
CUSFMAINT	00007	STATUS	CUSF	Sts <> bla	
CUSFMAINT	80000	USERN	CUSF	Contact =	Rule Status Comment
CUSFMAINT	00009	SALUT	CUSF	Salutation	Annotation
CUSFMAINT	00010	CUSNO	CUSF	Cus_No =	Width of selected column: 97
					OK Cancel

**Business Rules window – Configure Columns option** 

Filter the display of business rules using the various buttons. The rules can be filtered based on whether they are Exportable Rules, Update Rules, or Excluded Rules. These three filters have toggle behavior.



		Busin	ess Rules	window	– Filter buttons		
1	📮 Business Rules	×			🚡 🚡 7 🖨 🗵 🔻 🚺 🖛		
E	Business Rules for	CUSFMAINT, N	umber of Li	nes: 10			
l	Source Member	Rule Number	Field	File	Rule		^
	CUSFMAINT	00001	CUSNO	CUSF	Cus_No not found on Sites		
	CUSFMAINT	00002	CNAME	CUSF	Company = blank		
	CUSFMAINT	00003	TELNO	CUSF	Phone <> blank		$\mathbf{v}$
l	<					>	

Note: For details regarding Business Rules Status, refer to Appendix L.

## **Inter-Repository Options**

The **Inter-Repository Options** provides different sub-options for comparing database files (across any two cross-reference libraries) and managing linked repositories.

The **Difference Analysis** option analyzes the application database files and reports the difference with the files.

The **PTF Analysis** option analyzes the base and the customized applications for PTF analysis.

The **Manage Linked Repositories** option allows analysis of one or more IBM i and/or non-IBM i (Windows) cross-reference library to an existing cross-reference library.

The **Inter-Repository Options** is available on the context menu of the cross-reference library. The following group of options is available under it:

- Difference Analysis
- Generate Difference Analysis
- Display Difference Analysis
- PTF Analysis
- Customized Libraries
- Generate PTF Analysis
- PTF Analysis
- Manage Linked Repositories

Note: Fresche Legacy supplies the following two additional data libraries for demonstrating Difference Analysis and PTF Analysis:

XAN4CDEMCU – This library contains objects from XAN4CDEM with simulated changes. XAN4CDEMPT – This library contains simulated PTF for XAN4CDEM.

## **GENERATE DIFFERENCE ANALYSIS**

The **Generate Difference Analysis** option submits a batch job which populates data for Difference Analysis. You must provide the cross-reference library name which will used to compare the cross-reference libraries.

The following dialog is displayed when you select the **Generate Difference Analysis** option:

🖨 Generate Difference Analysis 🛛 🛛 🚺					
X-Ref Library	XAN4CDXA				
Other X-Analysis Repository	A_AGS 🖌 🖌				
Report Trivial Differences	*YES 💌				
Report DB rels and Biz Rules	*YES 💌				
Report on deleted objects	*NO 🔽				
()	Cancel				

#### Generate Difference Analysis dialog

## **DISPLAY DIFFERENCE ANALYSIS**

The **Display Difference Analysis** option displays the differences of the application database files and programs. The difference analysis data is available only when the difference analysis has been generated by selecting the **Generate Difference Analysis** option.

#### **Demo Case – Display Difference Analysis**

Create a demo case for better understanding of Display Difference Analysis. Follow the given steps:

1. Create a new X-Analysis application (call it **XAN4CDXC**) with the following libraries:

Source:

XAN4CDEMCU XAN4CDEM

Object:

XAN4CDEMCU XAN4CDEM



- 2. Initialize the new application.
- 3. To populate Difference Analysis data, opt for the context menu on the new X-Analysis application (XAN4CDXC), and then select the Generate Difference Analysis option from the Inter-Repository Options submenu. Select XAN4CDXC from the drop-down box, Other X-Analysis Repository. Then, click OK to submit the batch job.

🖶 Generate Difference Analysis 🛛 🛛 🔀					
X-Ref Library	XAN4CDXA				
Other X-Analysis Repository	A_AGS	~			
Report Trivial Differences	*YES	~			
Report DB rels and Biz Rules	*YES	~			
Report on deleted objects	*NO	*			
K	Cancel				

#### Generate Difference Analysis dialog

4. To display the Difference Analysis data, opt for the context menu on the new X-Analysis application (XAN4CDXC), and then select the **Display Difference Analysis** option from the **Inter-Repository Options** submenu. The following screen should appear:

**Display Difference Analysis for XAN4CDXA** 

ifference Analysis for X	AN4CDXA compared against X/	AN4CDX	C 🖨 🗵 🕇		đ	4
Heading/Object/Category	Description	Total	Library	Element	Difference	I,
CHANGED	Changed Files	18				I
CNTACS	Contacts	2				
FIELDS	Database File Fields	1				
	Field CUSNO has been changed.		XAN4CDEM		Changed	
RELNS	Database File Relationships	2				
CNTLF1	Global Contacts by Salesman	2				
FIELDS	Database File Fields	10				
🖃 KEYS	Database File Keys	2				
	Key no. 1 has been added.		XAN4CDEM		Added	
	Key no. 2 has been added.		XAN4CDEM		Added	
CNTLF2	Global Contacts by Name	2				

## **CUSTOMIZED LIBRARIES**

A customized library is where you would store programs taken from the vendor's library and modified. In this way you will retain the original programs from the vendor and have their modified version, too. The following dialog is displayed when you select the **Customized Libraries** option:

	Custo	omized Libraries of	dialog	
٢			×	
X@N YAN/	IAN IAND	Customized	*	Remove
Library			ed	Add
	Apply (	Changes Canc	el	

Provide valid entries for Customised Library (ies) and for Non-Customised Library (ies).

## **GENERATE PTF ANALYSIS**

The **Generate PTF Analysis** option submits a batch job which populates data for PTF Analysis. The following dialog is displayed when you select the **Generate PTF Analysis** option:

Generate PTF Analysis dialog					
🖨 Compare Base to PTF 🛛 🛛 🔀					
PTF Repository XAN4CDXA					
Base Repository A_AGS					
OK Cancel					

Provide the base repository name in the **Generate PTF Analysis** dialog and this will be used to compare the PTF repository with the base repository.

## **PTF ANALYSIS**

The PTF Analysis displays the comparison between the PTF repository and the base repository. Select the **Generate PTF Analysis** option first to access the PTF Analysis data.

### Demo Case – PTF Analysis

Create a demo case for better understanding of the PTF Analysis.. Follow the given steps to set up the demo case:

1. Create a new X-Analysis application (call it **XAN4CDXP**) with the following libraries:

Source:

XAN4CDEMPT

Object:

XAN4CDEMPT

- 2. Initialize the new application **XAN4CDXP**.
- To generate the PTF Analysis, the first step is to identify libraries as the customised libraries. Select the X-Analysis application – XAN4CDXC, and then select the Customized Libraries option from the Inter-Repository Options submenu on the context menu. This invokes the following dialog:

Custom	nized Libraries d	ialog	
🖨 Cu	stomized Libraries	;	×
Library Name	Customized		Remove
Library	Customiz		Add
Apply Cha	nges Cano	el	

Type in **XAN4CDEMCU** to the Library text box and check the **Customized** box. Then, click **Add**. This adds the **XAN4CDEMCU** library as the customized library.



-		omized Libraries d		
<b>.</b>	(	Customized Libraries	;	×
Library Name		Customized	^	
XAN4CDE	мсо	<b>`</b>		Remove
			~	
Library		Customiz	zed	Add
	Apply Cl	hanges Canc	el	

Now, add the **XAN4CDEM** library as non-customized library. Type in **XAN4CDEM** to the **Library** text box and un-check the **Customized** box. Then, click **Add**. This adds the **XAN4CDEM** library as a non-customized library.

Custo	illizeu Libraries u	laios
🗢 C	ustomized Libraries	;
Library Name XAN4CDEMCU XAN4CDEM	Customized	Remove
Library	Customiz	zed Add
Apply Ch	anges Canc	el

 The next step is to select the Generate PTF Analysis option. Opt for the context menu on the X-Analysis application – XAN4CDXP, and select the Generate PTF Analysis option from the Inter-Repository Options submenu. Enter XAN4CDXC in the Base

Repository. Click **OK** to submit the batch job.



Compare B	Base to PTF dialog	3
🖨 Compare Ba	ise to PTF	×
PTF Repository Base Repository	XAN4CDXP	<
	OK Cancel	

 The final step is to display the PTF Analysis data. Opt for the context menu on new X-Analysis application – XAN4CDXP, and then select the PTF Analysis option from the Inter-Repository Options submenu. The following screen should appear:

			FIF Allalysis IOLAAN	СБИ		
🔏 PTF Analy	ysis 🕅				-	
PTF Analys	is for XA	N4CDXP, Total	Objects: 45	🖨 🗵 •	6	₩ -
Class	Туре	Name	Description	PTF Change Date	Base Change Date	^
APPLY	*FILE	CUSFMAINTD	Customer Site Maintenance	19/03/10	28/09/09	T
APPLY	*FILE	ORGS	Organisations	19/03/10	28/09/09	
APPLY	*FILE	ORGSL1	Organisations by Name	19/03/10	28/09/09	
APPLY	*PGM	CUSGRSEL	Customer group Selection	19/03/10	08/03/10	
APPLY	*PGM	CUSTSSEL	Customer Selection	19/03/10	08/03/10	-
APPLY	*PGM	DISTSSEL	Distributor Selection	19/03/10	08/03/10	
APPLY	*PGM	DSPPTYPES	Display Product	19/03/10	28/09/09	
MODIFIED	*FILE	CNTCMAIN	Contacts Maintenance	19/03/10	18/03/10	
MODIFIED	*FILE	CONDET	Contract Detail	19/03/10	19/03/10	
MODIFIED	*FILE	CONDETL1	by Store/Contract/Product	19/03/10	18/03/10	
MODIFIED	*FILE	CONDETL2	by Store/Contract/Product	19/03/10	18/03/10	
MODIFIED	*FILE	CONDETL3	by Product/Contract	19/03/10	18/03/10	
MODIFIED	*FILE	CUSFSELD	Customer Site Selection	19/03/10	18/03/10	
MODIFIED	*FILE	CUSTMNT1	Customer Detail Maintena	19/03/10	18/03/10	
MODIFIED	*FILE	CUSTS	Purchases	19/03/10	18/03/10	~
MODIFIED	*FTI F	CUSTSI 4	hv Distributor/Customer	19/03/10	18/03/10	×
<						>

PTF Anal	vsis for	XAN4CDXP
PIF Anal	<b>Y</b> 212 101	AAN4CDAP

The first column of the PTF Analysis displays Class. The Class column can have any of the following entries:

**MODIFIED** = The object from the PTF library was found in one of the CUSTOMISED libraries.

**User Action**: The PTF object will have to be reviewed and changes applied in the CUSTOMISED library; manually applied to the object in the PTF library.

**NEW** = The object from the PTF library was not found in the base repository. **User Action**: The PTF object can be placed in the base library.

**APPLY** = The object from the PTF library was found in one of the BASE libraries (Vanilla) but not in any of the CUSTOMISED libraries.

User Action: The PTF object can overlay the object in the base library.

**REFERS** = The object from the PTF library refers to one or more objects in one of the CUSTOMISED libraries. The details are in XPTFROBJ.

User Action: The PTF object will have to be revised to make sure all customised objects referred to still meet the requirements of this object.

**REFERENCED** = The object from the PTF library is referenced by an object in one of the CUSTOMISED libraries. The details are in XPTFROBJ.

User Action: The CUSTOMISED objects will have to be reviewed to make sure the PTF object still meets the requirements of that object.

## **MANAGE LINKED REPOSITORIES**

If you want to link one or more IBM i and/or non-IBM i (Windows) cross-reference repository to an existing IBM i repository, select the Manage Linked Repositories option. The option is available under Inter-Repository Options. You can use this option to manage the linked repositories.

### Linking IBM i Repositories

The Manage Linked Repositories option opens the following dialog:

Manage Linked Repositories dialog
🖶 Manage Linked Repositories 🛛 🛛 🔀
AS/400 Repositories PC Repositories
Linkage Type *ADD
Host Name
Repository Select Add
Repository Name Location
Delete
OK Close

Manage Linked Repositories dialog

In the above dialog, Host Name is the field that will show the IP address of the AS/400 server whose repositories can be selected from the Repository Combo.

Add the repository (ies) on to the base (working) repository for combined analysis. The dialog lists all repositories available on the X-Analysis server, besides the base repository. You can select the repository to add.

Linkage Type: Link repository (ies) in the following two ways:

- *ADD In this mode, the cross-reference information from the entire linked repository (ies) is merged with those of the base repository on the X-Analysis lists and diagrams.
- ***REPLACE** Here, ONLY the distinct cross-reference information from the repository (ies) is put on the X-Analysis lists/diagrams. This depends on the sequence of the repositories.

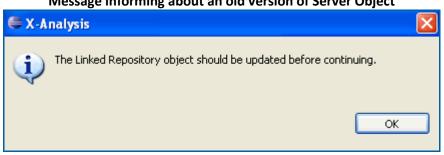
**Repository:** It lists all the X-Analysis repositories on the machine, besides the one working with. Select a repository to link with the base repository.

To link a repository, select the desired repository from Repository drop-down and click Add. This adds the selected repository to the linked repository list.

To delete the repository from linked repository list, select the repository and click **Delete**. This removes the selected repository from the linked repository list. The base repository, shown in blue, cannot be removed from the list.

Use the arrow buttons to change the sequence of the linked repositories.

Old Linked Repository Object - When the old users of X-Analysis select the Manage Linked Repositories option, they see the following information message:



#### Message informing about an old version of Server Object

In case you receive this message, then request Fresche Legacy for the updated Server Component(s).

_	
F	5
1.50	ACX

## Linking Non-IBM i (PC Repositories)

Click on the PC Repositories tab to invoke the following window:

Manage Linked Repositories – PC Repositories
🖨 Manage Linked Repositories 🛛 🔀
A5/400 Repositories PC Repositories
Linkage Type *ADD
DB2 Connection information
Host Name
DB2 User
DB2 Password
DB2 Port 50000
Fetch
Repository Select Add
Repository Name Location
Delete
OK Close

Note that in the above window, besides the DB2 Connection information group, all the other information will remain the same as specified for Linking IBM i Repositories (AS/400 Repositories).

The **DB2 Connection information** group is described as follows:

**Host Name:** Host Name is the name or IP address of the machine with which the DB2 connection is required.

**DB2 User:** Specify the DB2 user that uniquely identifies the DB2 user of the system and allows access to DB2 tools/services.

**Password:** Specify the password that is used for DB2 authentication, to prove identity or gain access to a DB2 resource.



**DB2 Port:** Specify the port number for the default DB2 instance where DB2 services must be running (Default DB2 port is 50000).

**Fetch:** After the DB2 information is supplied, click **Fetch** to populate the Repository Combo. Once this action is performed, you can select the repository to add.

# **Audit Options**

These options simplify the auditing processes for you by providing effective means to measure, monitor, and manage changes and complexity to applications. **Audit Options** are available on the context menu over the cross-reference library and application areas.

The following options constitute Audit Options:

- Metrics Analysis
- Screen Metrics
- File Metrics
- Business Process Logic Metrics
- Specialized Analysis
- Problem Analysis
- Object Allocation
- Database Summary
- Summary Report
- Initialize Source Archiving
- Generate Metrics Analysis
- Edit Problem Audit Limit
- Edit Problem Categories
- Generate Problem Analysis
- View Database Size Statistics

The Audit Options functionality is implicitly dependent on X-Rules for certain problem analysis categories and screen metrics. You must own the X-Rules license to generate Business Rules (for the X-Ref library) before using them.

The X-Audit features dependent on X-Rules license are "Program Code Alerts" under Problem Analysis and Screen Metrics information.

## **METRICS ANALYSIS**

**Metrics Analysis** is the first option under **Audit Options**. The **Metrics Analysis** option provides low, medium, and high complexity classification of each program based on the following attributes of the program:

- Source Type
- Source Lines
- Cyclomatic Complexity
- Halstead
- Maintainability Index
- Files
- Device files comprising Display Files and Printer Files
- Called Programs
- Calling Programs

The Metrics information is displayed under the following headings:

- Batch Programs
- Interactive Programs

These two highest levels are then further sub-categorised as High, Average, and Low.

The user-specified values determine where a program fits into these sub-categories. By default, these Preferences are blank, hence all programs are listed under 'Low' complexity, until values have been set using the Metrics Preferences, discussed below.

The following screen displays the Metrics information for the cross-reference library, **XAN4CDXA**:



Summary Metrics 🛛											
letrics Analysis for XAN4CDXA (Dou	ble Click to	View History)							🤞 🖨	≥	6
Complexity Level	Units	Text	Source Type	Source Lin	Cyc. Complex.	Halstead	Maint.Index	Files	Device Files	Called Programs	Calling Progra
⊿ Grand Total	188			27,730	18	976	77	434	70	277	18
Interactive Source Members	69			21,301	43	2,264	125	254	70	228	10
⊿ High Total	1			1,186	133	7,551	232	1	1	5	
High	ORGMNT	Organisation Main	RPG	1,186	133	7,551	232	1	1	5	
Average Total	33			17,596	62	3,241	153	170	33	163	3
b Low Total	35			2,519	23	1,191	96	83	36	60	7
⊿ Batch Source Members	119			6,429	3	230	49	180	0	49	8
High Total	0			0	0	0	0	0	0	0	
⊿ Average Total	2			1,156	54	4,580	148	6	0	1	
Average	WKCUS8E	Customer Release	RPG	735	76	5,752	198	2	0	0	
Average	WKSECF6	Generate CPU Letter	RPG	421	33	3,408	99	4	0	1	
b Low Total	117			5,273	2	156	47	174	0	48	ī
Application Area Breakdown											
a ACCOUNTS (+)	54			15,458	33	1,706	5	192	32	133	7
High Total	0			0	0	0	0	0	0	0	
Average Total	1			266	23	1,240	178	3	1	1	
b Low Total	1			156	25	1,144	144	2	1	1	
CUSFMAINT	52			15,036	34	1,726	105	187	30	131	1
CONHDR	98			22,057	23	1,320	108	312	41	145	1.
b High Total	1			1,186	133	7,551	232	1	1	5	
Average Total	28			15,784	66	3,636	158	155	26	129	3
b Low Total	69			5,087	4	289	86	156	14	11	ġ
USTOMERS (+)	45			12,212	29	1,450	27	122	38	102	21
High Total	0			0	0	0	0	0	0	0	
Average Total	4			2,435	71	3,772	188	29	4	24	1
b Low Total	10			633	6	188	50	9	9	0	7
DEC16	31			9,144	31	1,558	106	84	25	78	12
MVCPROCESS	16			3,811	25	1,301	88	44	14	32	8
IRAL TAAL	^			0	•	^	0	0	0	0	

### Metrics information for XAN4CDXA

The Metrics information displayed above has the following columns:

- Complexity Level: For each attribute 1 6, you will allocate weights, e.g. each file usage = 1, each Copybooks usage = 4, etc. The sum total of these per program will be calculated and the Complexity level for the program worked out. E.g. Points <10 -LOW, 10-20 - AVERAGE, >20 - HIGH. You can allocate weights in the General Metrics Preferences dialog.
- 2. **Units:** When collapsed, it displays the total number of programs. When expanded, it displays the names of the programs.
- 3. **Text:** Displays the description of the object.
- 4. **Source Type:** Informs about the type of source.
- 5. Source Lines: Total number of Source Lines in a source member.
- 6. **Cyclomatic Complexity:** Measures amount of decision logic in a program. Shows total number of conditional statements used.
- 7. **Halstead:** Displays program's complexity directly from source code based upon the operators and operands used.



- 8. **Maintainability Index:** The maintainability index is calculated with certain formulae from lines-of-code measures, Cyclomatic Complexity and Halstead complexity measures.
- 9. Files: Total number of Files used by the source member.
- 10. Device Files: Total number of Display and Printer Files used by the source member.
- **11. Called Programs:** Total number of called programs from the source member.
- 12. Calling Programs: Total number of calling programs from the source member.

Note: The Cyclomatic Complexity, Halstead, and Maintainability Index columns in the Metrics window display the average count. This can be seen in both the Group Total and the Grand Total.

The conventions that are used for processing Cyclomatic Complexity, Halstead and Maintainability Index are given below:

**Cyclomatic Complexity** – This is simply a count of the number of decision points and exit points in a module. In RPG, this would be a count for each subroutine or procedure (plus mainline) of how many statements have these operation codes:

- IFxx
- ELSEIF
- DOW
- DOU
- CABxx
- WHxx
- CASxx
- FOR

**Halstead measures** – These are five different measurements based on formulas applied to four different values obtained from the code, again, for each subroutine:

**n1** – the number of different op codes in the subroutine

n2 – the number of different variables (or files) used on all statements in the subroutine
 N1 – the total number of op codes used in the subroutine (some may be used multiple times)

N2 – the total number of all instances of variables in the subroutines

From these four numbers different measurements are calculated:

Module length = N1 + N2 Module vocabulary = n1 + n2 Halstead Volume = N * log(2)n Difficulty = (n1/2) * (N2/n2) Effort = Volume * Difficulty Maintainability Index – This is a formula based on some years of experience of Hewlett-Packard engineers. The lower the number, the less maintainable the code will be. This is also at the subroutine level. It uses four numbers as input:

HV – Halstead volume from above

CC – Cyclomatic Complexity from above

LOC – Lines of actual code in the subroutine

COM - Lines of non-blank comments in the subroutine (beginning after the previous ENDSR)

MI = 5.2*naturallog (HV) - 0.23*CC - 16.2naturallog (LOC) + 50.0*sin (square root (2.46*COM))

### **Metrics Toolbar**

The Metrics toolbar comprises various options which are discussed below.

Toolbar	available on	Metrics	Window

🔚 Summary Metrics 🛛	
Metrics Analysis for XAN4CDXA (Double Click to Yiew History) 🦽 🖨 🗵 🔻 🕀	# <b>A</b> -

### **Metrics Preferences**

You can set the Metrics Preferences as per your requirements.

General Metr	ics Prete	rences ico	n on Met	rics Windo	w Toolbar		
🕹 Object List 👘 🔐 Summary Metric	s 🛿						
Metrics Analysis for XAN4CDXA (Doub	le click to vi	ew History)		🎺 🖨 🗷 🔻	•	ana	•
Complexity Level	Units	Text	Source Type	So General Met	rics Preferences.	Halstead	^
⊿ Grand Total	205			31,146	16	907	
Interactive Source Members	69			21,301	43	2,264	
⊿ High Total	1			1,186	133	7,551	
High	ORGMNT	Organisation	RPG	1,186	133	7,551	v
<						>	

#### al Matulas Duafa ...... . ...

Click the General Metrics Preferences icon to invoke the following dialog:

#### **General Metrics Preferences dialog**

🖨 Metrics Pr	eference S	etting						
	Source Lines	Cyclomatic	Halstead	Maint. Id×.	Called Pgm.	Calling Pgm.	Files	Device Files
High Value	\$000							
Average Value	200							
							ок	Cancel

Specify a high value so that any value above this will determine that the program is of high complexity. Any program that falls below the Average setting will be determined as Low complexity.

### **Print Metrics**

To print the Metrics directly, select **Print**.

Pi	rint icon	on Metrics	Window	Toolbar			
🕹 Object List 💿 🔡 Summary Metric	s 🛛						
Metrics Analysis for XAN4CDXA (Doub	le click to vi	ew History)		🤞 🗬 🗵 🔻	<b>E</b>	舑	Ŧ
Complexity Level	Units	Text	Source Type	SourcePrint	Cyc. Compl	Halstead	^
	205			31,146	16	90	
Interactive Source Members	69			21,301	43	2,26	
⊿ High Total	1			1,186	133	7,55	v
<						>	

### **Export Metrics**

Select the PDF or MS Excel option as required under the Export Options icon.

#### **Export Options on Metrics Window Toolbar**

🕹 Object List 💿 🔡 Summary Metric	s 🛿						
Metrics Analysis for XAN4CDXA (Doub	ole click to vi	ew History)		16 🖨		Ē	# -
Complexity Level	Units	Text	Source Type	Source	2	Export to PDF	lsteac ^
⊿ Grand Total	205			3	2	Export to MS Excel	90
Interactive Source Members	69			2	1,301	43	2,26
⊿ High Total	1				1,186	133	7,55 🗸
<							>

### **Expand All**

Click the **Expand All** icon which will expand all the data.

<b>Expand All option on Metrics Wi</b>	ndow Toolbar
----------------------------------------	--------------

🕹 Object List 🛛 🔝 Summary Metric	s 🛿						
Metrics Analysis for XAN4CDXA (Doub	le click to vi	ew History)		🤞 🖨 🗷 🔻	R	舑	•
Complexity Level	Units	Text	Source Type	Source Lines	Expand All	Halstead	^
⊿ Grand Total	205			31,146	16	90	
Interactive Source Members	69			21,301	43	2,26	
⊿ High Total	1			1,186	133	7,55	¥
<						>	

The screen below shows the expanded window after the **Expand All** icon is clicked:



#### **Expanded Metrics window**

🚰 Summary Metrics 🛛						
Metrics Analysis for XAN4CDXA (Dou	ıble click to viev	v History)	<i>i</i> 👌 🖨	<u>a</u> e	# -	
Complexity Level	Units	Text	Source Type	Source Lines	Cyc. Complex.	^
	205			31,146	16	1
Interactive Source Members	69			21,301	43	
⊿ High Total	1			1,186	133	
High	ORGMNT	Organisation Mainte	RPG	1,186	133	
Average Total	33			17,596	62	
Average	CNTCMAINT	Contacts Maintenance	RPGLE	266	23	
Average	OE001	Order Entry	RPG	240	18	
Average	CUSTMNT1	Customer Detail Mai	RPGLE	336	21	
Average	WWCONDET	Work with Order Det	RPGLE	605	77	
Average	WWCONHDR	Work with Orders	RPGLE	741	95	
Average	WWCUSTS	Work with Customers	RPGLE	753	94	
Average	CON001	Contract Entry	RPG	271	22	×
<					>	

### **Metrics History**

The Metrics History displays all previous instances of the generated metrics data. The Metrics History data will be available only when the Metrics data is generated more than once.

The Metrics History can be generated for all individual levels – High, Average & Low Totals for Batch Programs or Interactive Programs and for the Grand Total also.

				,					
🔛 Summary Metrics 🛛									
Metrics Analysis for XAN4CDXA (Dou	ble Cli	ck to View Hist	ory)		🤞 🖨 🗵	• 🕀		A	•
Complexity Level	Units	s Source Type	Source Lines	Cyc.	Complex.	Halstead	Maint.Index	Files	^
🗉 Grand Total	127		11,826		1,750	90,333	7065	222	
Interactive Source Members	50		9,842		1,594	81,830	5694	163	
🗄 High Total	5		3,543		435	21,583	850	34	
🗄 Average Total	13		4,036		374	20,036	1962	46	
🖬 Low Total	32	Select High Tol	al / Average T	otal	785	40,211	2882	83	
😑 Batch Source Members 🗥	77		nd double click		156	8,503	1371	59	
High Total	0		listory window		0	0	0	0	
🗄 Average Total	1	. I.			33	3,408	99	- 4	
🗄 Low Total	76	One can also in window for Gra			123	5,095	1272	55	
		Program or Int							
	L	2							
									×
<								>	

**Invoking Metrics History** 

Select 'Low Total' row from the Metrics Window and perform double-click action to invoke the Metrics History window, as shown below:



#### Metrics History window

Metrics History for XAN4CDXA									
Complexity Level	Change Date	Source Lines	Cyc. Complex.	Halstead	Maint.Index	Files	Device Files		
🗉 Low Total	32								
	Current State	2,263	785	40,211	2882	83	33		
🕀 Total	20 months back (2011-08-19)	2,263	784	40,206	2882	83	33		
🕀 Total	23 months back (2011-06-04)	1,904	713	39,027	2599	73	29		
🗄 Total	34 months back (2010-07-02)	1,910	709	39,382	3057	73	29		
표 Total	39 months back (2010-02-08)	2,465	751	45,971	6674	73	29		
표 Total	42 months back (2009-11-14)	2,618	757	47,340	7644	73	29		

#### **Metrics History Chart**

X-Analysis can also display the Metrics History in a chart form for all individual parameters. The Metrics History toolbar contains a drop-down button called Metrics Analysis:

#### Metrics Analysis drop-down button

Summary Metrics	X	- 0
Metrics History for XAN4CDXA		× 🔊
Complexity Level Change Date	Source Lines Cyc. Complex. Halstead Maint.Index Files	Device Files
📕 Low Total 🛛 32		Metrics Analysis

The drop-down button contains the list of parameters against which a chart can be generated.

#### **Metrics History drop-down options**

🔝 Summary Metric	s 🛛 🔐 Metrics History 🔀						
Metrics History for XAN4CDXA							
Complexity Level	Change Date	Source Lines	Cyc. Complex.	Halstead	Mainl	Source Lines	Files
📃 Low Total	32					Cyc. Complex.	
	Current State	2,263	785	40,211	2882	Halstead	
표 Total	20 months back (2011-08-19)	2,263	784	40,206	2882	Maint.Index	
표 Total	23 months back (2011-06-04)	1,904	713	39,027	2599	Files	
표 Total	34 months back (2010-07-02)	1,910	709	39,382	3057	Device Files	
표 Total	39 months back (2010-02-08)	2,465	751	45,971	6674	Called Programs	
🗄 Total	42 months back (2009-11-14)	2,618	757	47,340	7644	Calling Programs	

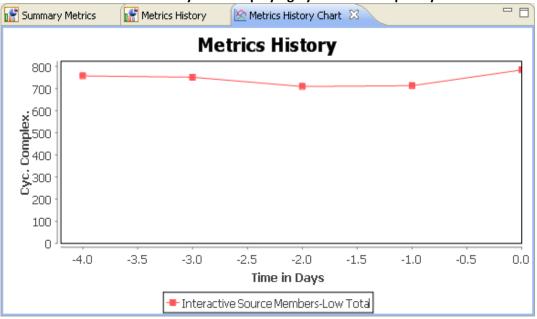
Select the Cyc. Complex. option from the drop-down menu:



#### **Cyclomatic Complexity option for Chart**

👫 Summary Metric	s 🛛 🕼 Metrics History 🔀								
Metrics History for XAN4CDXA									
Complexity Level Change Date Source Lines Cyc. Complex. Halstead Main Source Lines F									
🔳 Low Total	32					Cyc. Complex.			
	Current State	2,263	785	40,211	2882	Halstead 🗸			
🗄 Total	20 months back (2011-08-19)	2,263	784	40,206	2882	Maint.Index			
🗄 Total	23 months back (2011-06-04)	1,904	713	39,027	2599	Files			
표 Total	34 months back (2010-07-02)	1,910	709	39,382	3057	Device Files			
표 Total	39 months back (2010-02-08)	2,465	751	45,971	6674	Called Programs			
🗄 Total	42 months back (2009-11-14)	2,618	757	47,340	7644	Calling Programs			

This action invokes the Metrics History chart displaying Cyclomatic Complexity:



Metrics History Chart displaying Cyclomatic Complexity

Similarly, the user can generate charts for all the other parameters.

You can check Metrics History for all the Interactive Programs / Batch Programs and Grand Total from the Metrics window.

### Source code tracking

The Metrics History provides a facility to see changes in the source code. Expand the Metrics History and select a program as shown below:



	Invoking source	e code tra	cking		
👫 Summary Metric	is 🛛 🔐 Metrics History 🛛 🖉 🖄	letrics History Ch	art		
Metrics History f	or XAN4CDXA				🖄 •
Complexity Level	Change Date	Source Lines	Cyc. Complex.	Halstead	Maint.Index
🖃 Low Total	32				
	Current State	2,263	785	40,211	2882
표 Total	20 months back (2011-08-19)	2,263	784	40,206	2882
표 Total	23 months back (2011-06-04)	1,904	713	39,027	2599
🖃 Total	34 months back (2010-07-02)	1,910	709	39,382	3057
	OE004 (CHG 2010-09-03[21:26:30])				
	OE002 (CHG 2010-08-27[21:27:39])				
🛨 Total	39 months back (2010-02-08)	2,465	751	45,971	6674
표 Total	42 months back (2009-11-14)	2,618	757	47,340	7644
<	Ш	i			>

The Source Compare editor is invoked when a user double-clicks on the listed program, as shown below:

Text Compare				🕸 🕾 🖏
WKCUS8P (Changed on 2011-08-05)		WKCUS8P	of 2010-03-12	
I		с		MOV 🔼
с	MOVE '1	C C		REA
с	READ QL	С	*INLR	DOW
C *INLR	DOWEQ'C	С		EXC
с	EXCPTPF	С		REA
с	READ QL	с		END
с	END	00	SYSPRT H OO 1 OA	
OQSYSPRT H OO 1 OA		0	EF 1	
0 EF 1	PRI	0		
0	SRC	 07	TEND OF PGM	
<	>	<		>

#### Source Compare editor displaying the code differences

### **SCREEN METRICS**

The **Screen Metrics** option provides low, medium and high complexity classification of all the available screen functions. The screen metrics information is displayed for the complete application and for all the application areas.

The Screen Metrics information is displayed under the following headings:

- Grid type functions
- Record type functions

### Other functions

The following screen displays the Screen Metrics information for the cross-reference library **XAN4CDXA**:

🖺 Screen Metrics 🛛 🖓 🗖									
Screen Metrics for XAN4CDXA 🛷 🕀 🖨 🗵 🔻									
Complexity Level	Units	Files	Database Fields	Work Fields	Outgoing Calls	Incoming Calls	Function Keys	Conditioning Fields	^
🔳 Grand Total	88	131	664	324	64	30	36	734	
🗄 High	6	6	55	13	6	0	6	48	
🗄 Average	71	114	590	309	58	30	30	685	9
🗄 Low	11	11	19	2	0	0	0	1	
Application Area Breakdown									
E ACCOUNTS	63	106	576	276	56	22	31	612	
🗄 High	1	1	7	5	0	0	0	12	
Average	0	0	0	0	0	0	0	0	
🗄 Low	0	0	0	0	0	0	0	0	
E CUSFMAINT	62	105	569	271	56	22	31	600	¥

Window displayir	ng Screen Metric	s for XAN4CDXA
	ig Juicen Mieuri	

The Metrics information displayed above has the following columns:

- 1. **Complexity Level:** This shows various groups. The topmost group is either Grand Total, or App area totals. All functions in application areas or cross-reference application are then grouped based on complexity and then, on type of function
- 2. Units: Shows the number of functions in the group
- 3. Files: Total number of Files used by screen function
- 4. **Database Fields:** Total number of screen fields which are read from database fields
- 5. Work Fields: Total number of work fields in the group
- 6. **Outgoing Calls:** Number of functions called by this function
- 7. Incoming Calls: Number of functions calling this function
- 8. **Function Keys:** Total number of Function key-based actions called by functions in this group
- 9. **Conditioning Fields:** Number of fields on which there is a conditioning logic.

### **Screen Metrics toolbar**

The Screen Metrics toolbar comprises various options, which are discussed below:

Toolbar available on Screen Metrics window	
--------------------------------------------	--

🔚 Screen Metrics 🛛	- 8
Screen Metrics for XAN4CDXA	🤞 🕀 🖨 🗷 🔻

### **Screen Metrics Settings**

The user can set the Screen Metrics settings as per the requirements.

🐨 Screen Metrics 🛛					
Screen Metrics for X/	AN4CDXA				🎺 🕀 🖨 🗷 🔻
Complexity Level	Units	Files	Database Fields	Work Fields	Outgoing Calls Screen Metrics Setting
🔳 Grand Total	88	131	664	324	64

Click Screen Metrics Settings to invoke the associated dialog:

🖶 Screen Metrics Preference Setting								
	Files	Database Fields	Work Fields	Int. Calls	Fun Keys			
High Value	þ		3	4				
Average Value	1		1	1				
				ок	Cancel			

#### Screen Metrics Preferences dialog

The user can set the criteria for High / Average using the above dialog.

### **Expand All Screen Metrics Data**

Click **Expanded Screen Metrics** icon which will expand all the data.

#### Expanded Screen Metrics button on the Screen Metrics Toolbar

🔛 Screen Metrics 🛛 🕅						
Screen Metrics for	XAN4CDXA	i i				💰 🕀 🖨 🛛 🗸
Complexity Level	Units	Files	Database Fi	Work Fi	Outgoing	
🔳 Grand Total	88	131	664	324	64	30 Expanded Screen Metrics

### **Print Screen Metrics**

To print the Screen Metrics information, click the **Print** icon available on the toolbar.



Print button on the Screen Metrics Toolbar

😭 Screen Metrics 🛛						
Screen Metrics for X4	AN4CDXA				🤞 🕀 (	20-
Complexity Level	Units	Files	Database Fields	Work Fields	Outgoing Calls	3
🔳 Grand Total	88	131	664	324	64	Print

### **Export Screen Metrics**

Select the **PDF** or **MS Excel** option, as required under the **Export Options** icon.

Export Options on the Screen Metrics Toolbar							
🐨 Screen Metrics 🕺					_	• D)	
Screen Metrics for X	AN4CDXA				🦽 🕀 🖨 👔	2 -	
Complexity Level	Units	Files	Database Fields	Work Fields	🏊 Export to PDF	~t~	
🔳 Grand Total	88	131	664	324	🔄 Export to MS Excel		
🕀 High	6	6	55	13			

## FILE METRICS

The **File Metrics** option displays various metrics on all the files. The file metrics information is displayed for the complete application and for all the application areas.

The File Metrics displays information under the following headings:

- 1. Units: Displays total number of Files.
- 2. Fields: Displays the total number of fields available in the file.
- 3. Access Paths: The total number of access paths for the file.
- 4. **Creating Programs:** The number of programs creating records in this file.
- 5. Reading Programs: The number of programs reading this file.
- 6. Updating Programs: The number of programs updating records in this file.
- 7. **Deleting Programs:** The number of programs deleting records from this file.
- 8. **Total References:** The total numbers of programs referencing this file (in effect total of 3 6).

The following screen displays the File Metrics information for the cross-reference library, **XAN4CDXA**:

				, a y					
🚰 File Metrics 🛛								_	' 🗆
ile Metrics for XAN4CDXA							ê 🛛 •	ð	<b>a</b> -
Name	Units	Fields	Access Paths	Creating Pgms	Reading Pgms	Updating Pgms	Deleting Pgms	Total References	^
🔳 Grand Total	39	5561	80	3	156	29	22	210	
<b>#</b> ACCOUNTS	3	16	5	0	3	0	0	3	
A necoomb		10	•	•	•	•	•	0	-
<b>±</b> CONHDR	16	175	66	3	150	28	20	201	
E CONUPD	3	100	28	2	97	25	14	138	
<b># CUSFMAINT</b>	11	156	45	2	106	28	17	153	
E COSITIAINI	11	130	40	4	100	20	11	155	

#### Window displaying File Metrics for XAN4CDXA

### **BUSINESS PROCESS LOGIC METRICS**

+ CUSTOMERS 13 154 51

The Business Process Logic Metrics Report displays business process logic data in metrics form – Total Lines, Excluded Lines, Controller Lines, and Residual Logic.

143

2

28

19

192

The following screen displays the Business Process Logic Metrics Report for XAN4CDXA:

Image: Summary Metrics       Image: Summary Metrics         Business Process Logic Audit Report for XAN4CDXA       Image: Summary Metrics							
CB906R	141	6	0	135			
CNTCMAINT	196	19	0	177			
CNTCMAINTR	250	63	0	187			
CON001	278	65	0	213			
CON001R	441	169	0	272			
CUSCPY	61	0	0	61			
CUSEMAINT	254	19	0	235			
CUSEMAINTR	326	87	0	239			
CUSFMOLD	259	19	0	240	1		

#### **Business Process Logic Audit Report for XAN4CDXA**

Note: To use this option you must have the X-RPG Migrate license.

### **SPECIALIZED ANALYSIS**

The **Specialized Analysis** option allows users to design their own reports using the full metrics database in the defined system repository (the summary metrics described in the previous section uses a subset of this database). This reporting provides a valuable way to measure and manage the quality and complexity of a code base, either as a one-off or on an ongoing basis.

The Specialized report can be viewed in two ways:

Static reports.

Difference reports that show the changes in those values over a period of time.

Opt for the **Specialized Analysis** option from the **Audit Options** submenu. The following screen displays the Specialized Analysis for the application library, **XAN4CDXA**:

K-Analysis - Metrics for XAN4CDXA	🧭 🖳 庙			<b>#</b>
Category/Report	Run Number	Date	Туре	Status
RPG Metrics Reports				
COMPLEXP - General cross language complexity by program				
COMPLEXS - General cross language complexity by SUBROUTINE				
DATACPX - Program data complexity				
LOGICP - Program logic complexity				
LOGICS - Program logic complexity by subroutine				
Source/Object Reports				
HARDCODE - Programs with hardcoded libraries				
MISSING - Source or objects missing				
SRCOBJDT - Source change date after object created				
🖃 Database Reports				
DATAERR - Database file and member errors and alerts				
DSGNALRT - Database design alerts				

The user has the option to generate pre-configured reports. Select any report under the listed category, and then right click on it to invoke the context menu:

Context Menu on Rep	port Definition
---------------------	-----------------

RPG Metrics Reports				
COMPLEXP - General cross language complexity by program 📐	Run Metrics Re	nort.		
COMPLEXS - General cross language complexity by SUBROUT $\%$				
DATACPX - Program data complexity	Modify Report I			
LOGICP - Program logic complexity		Copy Report Definition		
LOGICS - Program logic complexity by subroutine	Delete Report I			
Source/Object Reports				
HARDCODE - Programs with hardcoded libraries				
MISSING - Source or objects missing				
SRCOBJDT - Source change date after object created				
🖃 Database Reports				
DATAERR - Database file and member errors and alerts				
DSGNALRT - Database design alerts				

#### **Run Metrics Report**

When the user opts for this option, the pre-configured report dialog invokes:



🖨 X-Analysis Metr		pecification and Submi	ssion	
Report Name: Report Title: Report category: Application Area: Object Name: Select Report Colu	RPGMET *ALL	anguage complexity by progra	Edit cat	egories
Column OBJNAM OBJATR CYC HAL MI SRCLINST		Metrics Object and Source ID Data Object Library Object Name Object Type Object Attribute Object creation date Object last used date Source File Source File Source file change date Source Code Metrics	VarName OBJLIB OBJNAM OBJTYP OBJATR OBJCRTDAT OBJCRTDAT OBJSRCFIL OBJSRCFIL OBJSRCLIB	Subr
Filter:		<pre>report data at subroutine lev = 'RPG' OR OBJATR = 'RPGLE</pre>		
Search variab User metric fo				
User program		Outfile: X.	AN4CDXA "/XM"	COMPLE
	Submit Re	eport Can	cel	

Click **Submit Report** to generate the report. A batch job will be invoked and upon its completion the Specialized Analysis window will be updated:

### **Report Definition dialog**

#### **Specialized Analysis window**

🚰 Specialized Analysis 🛛					
X-Analysis - Metrics for XAN4CDXA		I I 🗸 🖪 🗎		₿¥	<b>a</b> -
Category/Report	Run N	Date	Туре	Status	^
RPG Metrics Reports					
🚊 COMPLEXP - General cross language complexity by program					
	1	2013-06-06	Metrics data	Submitted	
COMPLEXS - General cross language complexity by SUBROUTINE					
DATACPX - Program data complexity					
LOGICP - Program logic complexity					
LOGICS - Program logic complexity by subroutine					
Source/Object Reports					
HARDCODE - Programs with hardcoded libraries					
MISSING - Source or objects missing					
SRCOBJDT - Source change date after object created					
🖃 Database Reports					
DATAERR - Database file and member errors and alerts					
DSGNALRT - Database design alerts					1
<				>	

To view the generated report, select the report and right-click on it, which invokes the context menu. Select the **View Report** option as displayed below:

-Analysis - Metrics for XAN4CDXA		🗢 🖳 庙		番	
Category/Report	Run N	Date	Туре	Status	
RPG Metrics Reports					
COMPLEXP - General cross language complexity by program					
	1	2013-06-06	Metrics data	Complete	
COMPLEXS - General cross language complexity by SUBROUTINE		View Report	N		
	1	Show Trends	😽 rics data	Complete	
DATACPX - Program data complexity	L				
LOGICP - Program logic complexity					
LOGICS - Program logic complexity by subroutine					
Source/Object Reports					
HARDCODE - Programs with hardcoded libraries					
MISSING - Source or objects missing					
SRCOBJDT - Source change date after object created					
Database Reports					
DATAERR - Database file and member errors and alerts					
DSGNALRT - Database design alerts					

**Updated Specialized Analysis window** 

The following similar report will be displayed. The user can export this report to MS Excel.





🚰 Specialized Ai	esturia 🕞 co		IPLEX Report			P
		Jage complexity by program	Run 1, Total Objects:	72		
Object Name	Object Attribute	Sum of Cyclomatic Complexity	Sum of Halstead Vol	Greatest Maintainability Index	Source statements	^
🛨 CB903R	RPG	17	1072	164	139	
🗄 CB905R	RPG	21	730	93	103	
🗄 CFD211	RPG	7	52	55	8	
🗄 CONFIX1	RPG	1	52	58	10	
🗄 CONFIX2	RPG	1	48	59	11	
	RPG	22	1295	162	271	
🗄 CUSLETSQ	RPG	1	55	20	11	
🗄 CUSRGZ	RPG	2	102	20	17	
FAXERR1	RPG	6	117	39	26	
FAXERR2	RPG	6	119	39	26	
E FAXNOS1	RPG	4	69	72	21	v
<					>	

### **Modify Report Definition**

The user has the option to modify the existing report definition.

### **Modify Report Definition option**

Analysis - Metrics for XAN4CDXA	🗢 🖳 🔓			#
Category/Report	Run N	Date	Туре	Stat
RPG Metrics Reports				
COMPLEXP - General cross language complexity by program				
COMPLEXS - General cross language complexity by SUBROUTINE				
DATACPX - Program data complexity	Run Metric	s Report		
LOGICP - Program logic complexity	Modify Rep	oort Definit	ion N	
LOGICS - Program logic complexity by subroutine	Copy Repo	ort Definitio	n ki	
Source/Object Reports	Delete Rep	ort Definit	ion	
HARDCODE - Programs with hardcoded libraries	-		_	
MISSING - Source or objects missing				
SRCOBJDT - Source change date after object created				
🖃 Database Reports				
DATAERR - Database file and member errors and alerts				
DSGNALRT - Database design alerts				

Select the **Modify Report Definition** option to invoke the report configuration dialog:



	F	Report Definition dialog				
🖨 X-Analysis Metr	ics: Report	Specification and Subm	ission		X	
Report Name:	COMPLEXS					
	k	s language complexity by SUBR				
Report Title:	raeneral cross	s language complexity by SUBR	OUTINE			
Report category:	RPGMET	Edit categories				
Application Area:	*ALL	<ul> <li>All Members Select</li> </ul>	ted			
Object Name:						
Select Report Colu	mns and Optio	ns				
Column		Metrics	VarName	Subr 🔼		
OBJNAM		Object and Source ID Data				
OBJSUBNA	M	Object Library	OBJLIB			
OBJATR		Object Name	OBJNAM			
CYC		Object Type	OBJTYP			
HAL		Object Attribute	OBJATR			
MI		Object creation date	OBJCRTDAT			
SRCLINST	м 🔿	Object last used date	OBJLSUDAT			
		Source File	OBJSRCFIL			
		Source Library	OBJSRCLIB			
		Source file change date	OBJSRCFCHD	~		
		ow report data at subroutine le 'R = 'RPG' OR OBJATR = 'RPGL		~		
Filter:				~		
Search variab	bles:			~		
User metric fo	ormula:					
User program	User program:					
		Outfile:	XAN4CDXA "/XM"	COMPLE		
Save and Subm	Save and Submit Report Save Definition Only Cancel					

After changing the report definition, click **Save Definition Only**. If you would like to generate the report then click **Save and Submit Report**.

### **Copy Report Definition**

The user has the option to copy the existing report definition. It can be used when the user wants to retain the existing report as well as have a customised report.



#### **Copy Report Definition option**

🔚 Specialized Analysis 🛛			
X-Analysis - Metrics for XAN4CDXA	I 🕄 🖷 🔚	#A •	
Category/Report	Run N Date Ty	/pe Status	
RPG Metrics Reports			
COMPLEXP - General cross language complexity by program			
COMPLEXS - General cross language complexity by SUBROUTINE			
DATACPX - Program data complexity	Run Metrics Report		
LOGICP - Program logic complexity	Modify Report Definition		
LOGICS - Program logic complexity by subroutine	Copy Report Definition		
Source/Object Reports	Delete Report Definition		
HARDCODE - Programs with hardcoded libraries		_	
MISSING - Source or objects missing			
SRCOBJDT - Source change date after object created			
Database Reports			
DATAERR - Database file and member errors and alerts			
DSGNALRT - Database design alerts			

### **Delete Report Definition**

The user can delete an existing report definition using the **Delete Report Definition** option:

### **Delete Report Definition option**

🚰 Specialized Analysis 🛛				
X-Analysis - Metrics for XAN4CDXA	🥏 🖳 🗎			A -
Category/Report	Run N	Date	Туре	Status
RPG Metrics Reports				
COMPLEXP - General cross language complexity by program				
COMPLEXS - General cross language complexity by SUBROUTINE DATACPX - Program data complexity LOGICP - Program logic complexity LOGICS - Program logic complexity by subroutine	Copy Rep	ts Report port Definit ort Definition port Definit	n	
HARDCODE - Programs with hardcoded libraries			N	
MISSING - Source or objects missing				
SRCOBJDT - Source change date after object created				
Database Reports				
DATAERR - Database file and member errors and alerts				
DSGNALRT - Database design alerts				

### **Specialized Analysis Toolbar**

The Specialized Analysis toolbar comprises various options which are discussed below:

Specialized Analysis To	oolbar	
🐨 Specialized Analysis 🛛		- 8
X-Analysis - Metrics for XAN4CDXA	I 🗸 🖳 📠	A •

### **Refresh Metrics**

The **Refresh Metrics** icon performs the refresh function.

**Refresh Metrics icon on Specialized Analysis Toolbar** 

🕼 Specialized Analysis 🛛		
X-Analysis - Metrics for XAN4CDXA	🥏 🔍 庙 📃	#A -
Category/Report	🕺 🕺 🕺 🕺 Type	Status
RPG Metrics Reports	Refresh Metrics	

### **Create New Report**

The user can create a customised report. For this, the **Create New Report** icon is available on the toolbar:

🐨 Specialized Analysis 🛛	
X-Analysis - Metrics for XAN4CDXA	🗢 🖳 庙 🔤 🗛 -
Category/Report	Run 🕰 Date Type Status
RPG Metrics Reports	Create New Report

The following report definition dialog is invoked when the user clicks the **Create New Report** icon:

-Analysis Metric	cs: Report S	pecification and Submi	ssion	
	RPGMET *ALL	All Members Selec	Edit cate	egories
Column		Metrics	VarName	Subr 🔺
Filter:	() () () () () () () () () () () () () (	Object and Source ID Data Object Library Object Type Object Type Object Attribute Object creation date Object reation date Source File Source Edvary Source file change date Source file change date Source file change date	OBJLIB OBJNAM OBJATR OBJCRTDAT OBJSCRTDAT OBJSRCFIL OBJSRCFIL OBJSRCFIL OBJSRCFCHD	
Search variable	es:			~
User metric for	mula:			
User program:				
			KAN4CDXA "/XM"	
Save and Submit	Report	Save Definition Only		Cancel

### Create New Report dialog

The user can view log related to Metrics processing. The **View Log** icon is available on the toolbar as shown below:

🔛 Specialized Analysis 🛛	- 8
X-Analysis - Metrics for XAN4CDXA	🗢 🗉 👰 📃 🗛 -
Category/Report	Run N Date Type Status
RPG Metrics Reports	View Log

Click the **View Log** icon to check the log:

	VICT		
🚡 View Log 🛛			
Log Report, Number of Lines: 3738			
Log Time	Report name	Log text	^
2013-06-06 11:56:05.480000	COMPLEXS	SQLSTT :01567 SQLERM :	
2013-06-06 11:56:05.337000	COMPLEXS	Create table XAN4CDXA/XMCOMPLEXS (runrptnam varcha	
2013-06-06 11:56:05.335000	COMPLEXS	Execution started for run number: 1	
2013-06-06 11:56:04.876000	COMPLEXP	SQLSTT :01567 SQLERM :	
2013-06-06 11:56:04.746000	COMPLEXP	Create table XAN4CDXA/XMCOMPLEXP (runrptnam varcha	
2013-06-06 11:56:04.699000	COMPLEXP	Execution started for run number: 1	
2013-06-06 11:56:04.438000	!XMETGEN	DLTHST(*NO ) New metrics data not generated because	
2013-06-06 08:58:58.070765	COMPLEXS	Data report submitted for run number 1 with Job details:	
2013-06-06 08:34:29.783832	COMPLEXP	Data report submitted for run number 1 with Job details:	
2013-06-04 17:45:34.573000	!XREFRESH	24 programs logged with metrics and/or source changes.	
2013-06-03 12:55:36.852000	IXREFRESH	0 programs logged with metrics and/or source changes.	*

#### View Log window

### **PROBLEM ANALYSIS**

After the Generate Problem Analysis batch job is over, select the **Problem Analysis** option from the **Audit Options** under the context menu on **XAN4CDXA**, to display the Problem Analysis data.



### **Problem Analysis for Cross-Reference**

roblem Analysis data for XAN4CDXA - Total Problems: 435	â (	× R ×	<b>#</b> 1
Alert/Category/Object	Total	Description	· · ·
▲ Source/Object Alerts	14		
Source member changed after devicefile created	2		
No file found for existing source member	8		
No source member for file	6		
No program object found for source member	31		
No source member for program/module	8		
Source member changed after file created	67		
No device file found for existing source member	8		
No source member for device file	5		
Referenced data area does not exist	1		
Referenced database file does not exist	2		
Referenced other file does not exist	1		
Referenced program object does not exist	18		
No source member for copy book	2		

Expand the available Problem Category section to view name of the files having problems.

There is an option to allow **Customized Export to Excel** for the Problem Analysis data.

Problem Analysis data for XAN4CDXA - Total Problems: 435	8	2 🛛 👻	孡
Alert/Category/Object	Total	Customized Export to Excel	,
Source/Object Alerts	14	customized export to exect	
Source member changed after devicefile created	2		
CON001DF		Order Entry Display	
CUSFMAINTD		Customer Site Maintenance	
b No file found for existing source member	8		
b No source member for file	6		
b No program object found for source member	31		
No source member for program/module	8		
Source member changed after file created	67		
<			>

#### **Customized Export to Excel option**

Clicking on this icon will invoke the following dialog:



#### Select Alert/Category dialog

Select Alert/Category	×
Select the Alert/Category to export  Export All	_
<ul> <li>Source/Object Alerts</li> <li>Database Alerts</li> <li>Program Code Alerts</li> <li>Migration Alerts</li> <li>DDL Conversion Issues</li> </ul>	
▷ □ Others	
OK Cancel	

The user can individually select Categories to be exported to Excel. By default, the **Export All** box is checked.

### **OBJECT ALLOCATION**

The **Object Allocation** option displays the information about all objects along with the application area names to which they belong. The following screen displays the Object Allocation window:

	Objec	ct Allocation	IOF XAN4CD/	<b>NA</b>		
👫 Specialized Ar	nalysis 💦 📑 Problem A	nalysis 🔒	Object Allocation	1 23		
Allocation of O	bjects for XAN4CDXA, T	otal Objects: 4	32 🧧		<u>a</u> r	4 -
Name	Description	Туре	Attribute	Application Area:	Library	^
ASIMPLTEST		*FILE	PF		XAN4CDEM	-
ASTATUS	Status file	*FILE	PF	XXX *	XAN4CDEM	
BALANCEPRD	Balance by Product	*QMQRY	SQL		XAN4CDEM	
BALANCEPRD	Balance by Product	*QMFORM	QUERY MGR		XAN4CDEM	
BALANCESTO	Balance by Store	*QMQRY	SQL		XAN4CDEM	
BALANCESTO	Balance by Store	*QMFORM	QUERY MGR		XAN4CDEM	
CBCUSTSD	Work with Customers	*FILE	DSPF	2EUG *	XAN4CDEM	
CBCUSTSD0	Work with Customers	*FILE	DSPF		XAN4CDXA	
CBC110	Order Entry System	*PGM	CLP		XAN4CDEM	
CB906R	Back-out account	*PGM	RPG	XXX *	XAN4CDEM	
CB906RD	Order Entry display file	*FILE	DSPF	XXX *	XAN4CDEM	
CB906RDXL1		*FILE	DSPF	XXX *	XAN4CDXA	
CB906RR	Back-out account	*PGM	RPG	XXX *	XAN4CDXA	~

### **Object Allocation for XAN4CDXA**

The above screen lists all objects from the application library, **XAN4CDXA** and provides information about application areas. Notice that some rows were blank under the

application area column, which means that the object does not belong to any application area. Similarly, note the '*' sign which means that the object belongs to multiple application areas.

### **DATABASE SUMMARY**

The **Database Summary** option gives the user access to the summarized database report for the entire cross-reference library. The report contains information related to files, their unique keys and other necessary file-related details. On clicking the option, the following window is displayed:

🔐 Specialized	l Analysis 🛛 📑 Pro	blem Analysis	🔡 DB Summar	y 🕱		-	
Database Su	immary Report for 3	XAN4CDXA			. ح	A	₩.
File	Unique Keys	Parent File No.	Child File No.	File With Identical Key	Foreign Keys to Parent	Foreign Keys from Child	
ASTATUS	STATUS	2	0	0	1	0	
CNTACS	CUSNO, PRPCDE	0	5	0	0	5	
CONDET	XWORDN, XWABCD	2	6	1	2	4	
CONDETNW	XWORDN, XWABCD	2	1	1	2	1	
CONHDR	XWORDN	4	3	0	1	3	
CUSF		3	5	0	1	5	
CUSGRP	XWBNCD	2	0	0	1	0	
CUSTS	XWBCCD	3	4	0	1	4	
DELIVA	XWBDCD	1	1	0	1	1	
DISTS	DSDCDE	2	0	0	1	0	
EVFEVENT		0	0	0	0	0	<b>Y</b>

#### **Database Summary Report window**

### SUMMARY REPORT

The **Summary Report** option is available under the **Audit Options** submenu on the context menu of cross-reference library and application areas.

udit Report - Type a				
Select the type of document	ation and its loc	ation		=
Audit report generates:				
- Single document with docun	nentation of the	selected Applica	ation Area/Cro	ss-Ref.
-Audit report Documentation	n type			
📀 Generate Single Audit re	eport Document			
🔘 Generate Audit report L	Jsing Previous V	alues		
Document Details				
Name:				Browse
Audit Report for XAN4	ICDXA.pdf			
Path:				
D:\Program Files\Data Report for XAN4CDXA		ysis\192.168.17	0.10\PCF_XAM	V4CDXA\Audit

Specify Type and Location. Click Next.

5

LEGACY



### Summary Report – Options

🖨 X-Analysis				
Audit Report - Opt Select option to be inclu				
Audit Report			6	
Problem Analysis Summary	ODetailed			
Difference Analysis	O Detailed			
Business Process Lo	ogic Metrics			
0	< Back	Next >	Finish	Cancel

Mark options to be included in the Summary Report and click Next.

#### Summary Report – Specify Sequence

🖶 X-Analysis	
Audit Report - Specify Sequence What sequence would you like to have for the Audit report?	
Metrics Analysis Problem Analysis Difference Analysis	Move Up Move Down
? < Back Next >	Finish Cancel

Specify the sequence of contents for the Summary Report and click **Next**.

#### Summary Report – Finish

🖨 X-Analysis	
Audit Report - Finish Define the Page Size and Contention Resolution Option	
Selected Sequence Metrics Analysis Problem Analysis Difference Analysis	Paper Size • Letter (8.5" × 11") • A4 Size (8.27" × 11.69")
Contention Resolution Audit report creates documents in Application Folder. I shared, and documents are created/opened while the then this may lead to contention. Please select appropriate options to enable resolution	documentation is in progress,
	/Skip document creation
Pack Next	> Finish Cancel

Choose desired settings for the Audit Report and click **Finish** to generate the report. When the generation is over, the following dialog appears which asks to open the generated document:

🖨 X-A	nalysis 🛛 🔀
2	Audit Report Documentation process completed. The documents has been saved in
	D:\Program Files\Databorough\X-Analysis\192.168.170.10\PCF_XAN4CDXA\Audit Report for XAN4CDXA.pdf
	Do you want to open this?
	Yes No

#### X-Analysis dialog to open the generated report

### **INITIALIZE SOURCE ARCHIVING**

Source archiving can be run independently of metrics. The **Initialize Source Archiving** option is available for the cross-reference library and the application areas. When the user chooses the option, the following dialog is invoked:

🖨 Initialize Source Archiving		×
X-Ref Library	XAN4CDXA	
Archive from XA4INIT process	*YES	*
Archive from XREFRESH process	*YES	*
Archive from XA4MAINT process	*YES	*
Archive from XA4SRCMNT process	*YES	*
ОК	Cancel	

Source archiving is started by the **XACVINI** command, which sets up a controlling *DTAARA in the XA library and makes an initial copy of all source codes. If archiving is deactivated and then restarted later, the initial archived copy is not made. Source archiving can be deactivated by XACVEND, which optionally clears all source archives and controlling data. This command can only be run on the server.

### **Files**

All archived source versions are recorded in XAACVSRC, whose data is only ever purged when XACVEND DLTHISTO(*YES) is run (whereas metrics can be purged independently, which clears XMETOBJ). When archiving is active, the source date-time of the latest version archived is recorded in XAACVHDR. Archiving handles all the source types (whereas metrics only records for CL, RPG and CBL).

Source archiving continues to maintain data in XMETOBJ/XMETOBJH, if necessary. The data in XMETOBJ/XMETOBJH is not necessary to the source archiving process itself, but is used by the PC client to locate the change history. If data is written to XMETOBJ by source archiving, the SRCACT field is set to the value 'A'.

### Processing

Source archiving is invoked from XA4INIT, XREFRESH, XA4MAINT and XA4SRCMNT, which all call the wrapper program, XRACVMBR.

The archive processing itself is done in *srvpgm XACV, in procedure XACV_ArchiveMember(). This procedure checks the source update date-time against the date-time recorded in XAACVHDR. If there is a difference, archiving takes place i.e. copy

the source, write out to XAACVSRC, update XAACVHDR, and write out to XMETOBJ/XMETOBJH, if appropriate data is not already present in these files.

The wrapper command/program XACVMBR/XRACVMBR first checks whether metrics is active, then performs either:

a) if metrics are active, writes out a record to XMETCHGS, which will cause metrics processing to take place when XRMETCHGS is called, which is the case in XREFRESH, XA4INIT, and XA4SRCMNT or

b) if metrics are not active, calls procedure XACV_ArchiveMember().

If metrics is active, then the source archiving call is made from metrics processing, which will call XACV_ArchiveMember(). This is so that metrics will write the appropriate XMETOBJ/XMETOBJH records before source archive processing takes place.

#### <u>Purge</u>

A purge process (command XACVPRG) will move source to a user-specified library, and record the location in XAACVSRC. Purge is by cut-off date, as compared to the archive timestamp in XAACVSRC. The purge process always leaves one source version in place, even if the timestamp is older than the cut-off date.

### **GENERATE METRICS ANALYSIS**

The **Generate Metrics Analysis** option generates the metrics data for the selected crossreference library. The following dialog is displayed when you select the **Generate Metrics Analysis** option:

Generate Metrics dialog		
🖨 Update Metrics		
X-Ref Library	XAN4CDXA	
Update metrics & Dlt history	*NO 🔽	
ОК	Cancel	

A batch job is submitted when the user clicks **OK**.

### **EDIT PROBLEM AUDIT LIMIT**

When you select the option, the following dialog is displayed:



#### Edit Problem Limit dialog

۲	Edit Proble	-	×
Limi	t ID	Limit Value	1
EXC	GOTO	0	
EXC	IFDP	5	
EXC	ELSEDP	1	
EXC	LOOPDP	1	
EXC	SUBRLN	80	
EXC	IFLN	48	
	Save	Cancel	

The Limit Value given in the above dialog is user configurable. The values shown are set by default. When you assign a new value through the above dialog, it determines the inclusion of the category in the Problem Analysis process. Click **Save** to apply your changes. The changed value will get reflected in the related table on the server-side.

### **EDIT PROBLEM CATEGORIES**

You can add a new category or edit/delete a previously-existing category by selecting the **Edit Problem Categories** option. Such modifications can be made for the main category i.e. the Problem Category group as well as for the sub-categories. Select the option to invoke the following dialog:



Problem Cat	egory 🛛			
it Problem Ca	ategories			
ategory Grou	p			
Problem Category Group Source/Object Aler		Source/Objec	t Alerts V Edit A	dd De
roblem Categ	Jory			
Seq No	Catego	ory	Description	^ Ed
5	DEVEN	AISMCH	Source member changed after devicefile created	
5	DEVIIV	nomen	Source member changed after deviceme created	
10		ISMCH	Source member changed after file created	Ad
		ISMCH	_	Ad
10	FILEMI	ISMCH EOBJ	Source member changed after file created	Ad
10 15	FILEMI	ISMCH EOBJ ESRC	Source member changed after file created No file found for existing source member	
10 15 20	FILEMI NOFILI NOFILI	ISMCH EOBJ ESRC MOBJ	Source member changed after file created No file found for existing source member No source member for file	
10 15 20 25	FILEMI NOFILI NOFILI NOPG	ISMCH EOBJ ESRC MOBJ	Source member changed after file created No file found for existing source member No source member for file No program object found for source member	
10 15 20 25 30	FILEMI NOFILI NOFILI NOPG	ISMCH EOBJ ESRC MOBJ MSRC ISMCH	Source member changed after file created No file found for existing source member No source member for file No program object found for source member No source member for program/module	
10 15 20 25 30 35	FILEMI NOFILI NOFILI NOPG FILEMI	ISMCH EOBJ ESRC MOBJ MSRC ISMCH OUD	Source member changed after file created No file found for existing source member No source member for file No program object found for source member No source member for program/module	
10 15 20 25 30 35 40	FILEMI NOFILI NOFILI NOPG NOPG FILEMI 2EFILE	ISMCH EOBJ ESRC MOBJ MSRC ISMCH OUD VOBJ	Source member changed after file created No file found for existing source member No source member for file No program object found for source member No source member for program/module Source member changed after file created	
10 15 20 25 30 35 40 45	FILEMI NOFILI NOFILI NOPGI FILEMI 2EFILE NODE	ISMCH EOBJ ESRC MOBJ MSRC ISMCH OUD VOBJ VSRC	Source member changed after file created         No file found for existing source member         No source member for file         No program object found for source member         No source member for program/module         Source member changed after file created         No device file found for existing source member	

Use the **Edit**, **Add**, or **Delete** buttons to make changes to the Problem Category Group. Click **Edit** to invoke the following dialog:

<b>\$</b>	X-Analysis	
Problem Catego Group Number		
Description	Source/Object Alerts	
	Save Cancel	

Edit the Group Number and/or the Description. Click Save.

Click **Add** to invoke the following dialog:



X-Analysis     Problem Category Group   Group Number   Description     Category Group   Seq No   Severity   Category   Description     Save     Cancel	Add dialog – Problem Category Group	
Group Number	X-Analysis	×
Save Cancel	Group Number Description Category Group Seq No Severity Category	
	Save Cancel	

Enter details in the given fields. In the Category Group section, enter the sequence number and the severity scale to be assigned to the new category. The Severity scale indicates the complexity of the problem and is based on the combination of problem report data and additional data. Click **Save**. The new category will appear in the **Edit Problem Categories** window.

On selecting the **Delete** option, a window appears which asks the user's confirmation before deleting a specific category.

Similarly, you can select the **Edit** and/or **Delete** options for the displayed sub-categories. By selecting the **Add** option, the user can add a new category under a pre-defined main category.

Note that you must make a few changes on the server-side for editing the problem categories on the client-side.

If you have to add new problem category TRIGGERS with description like "FILE HAS TRIGGERS", follow the steps given below to add problem category in the **XPRBCATS** file.

Host 192.168.21.102 Port 23	Workstation ID: Disconnect
Columns	
SEU==>	XRADDTRGRS
	1+ 2+ 3+ 4+ 5+ 6+ 7
0059.00	prbcat = 'TRIGGERS';
0061.00	<pre>setll(e) prbcat xprbcats; if not %equal(xprbcats);</pre>
0062.00	11 not %equal(xprbcats);
0063.00	// Category group number
0064.00	catgrpn = 2;
0065.00	
0066.00	// Category sequence number
0067.00	catsegn = 40;
0068.00	
0069.00	// Category description
0070.00	<pre>catdes = 'File has triggers';</pre>
0071.00	
0072.00	// Write the records
0073.00	write(e) rprbcats;
0074.00	
0075.00	endif;
F3=Exit F5=	Refresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat fi	
FIG-Repeat fi	nd F24=More keys

You will get CATGRPN and CATSEQN fields value from XA while adding new problem category.

To write the entry in the **XPRBOBJS** file for the above category you have to write your own logic as displayed below:

Host: 192.168.21.102 Port: 23	Workstation ID: Disconnect
Columns	
SEU==>	XRADDTRGRS
	• 1+ 2+ 3+ 4+ 5+ 6+ 7
0085.00	read(e) xtriggers;
0086.00	dow not %eof(xtriggers) and not %error;
0087.00	if trfile <> *blanks and trtrig <> *blanks;
0088.00	
0089.00	<pre>// Ensure the file object exists</pre>
0090.00	<pre>chain(e) (trfile:'*FILE') xobjectl1;</pre>
0091.00	if %found(xobjectl1) and not %error;
0092.00	
0093.00	// Retrieve the source file and source library details
0094.00	<pre>chain(e) (trfile:trfatr) xmemberl1;</pre>
0095.00	if %found(xmemberl1) and not %error;
0096.00	
0097.00	// Source library
0098.00	<pre>prbsrclib = x#lib;</pre>
0099.00	
0100.00	// Source filey
0101.00	<pre>prbsrcfil = x#srcf;</pre>
F3=Exit F5	5=Refresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat	find F24=More keys

Eile Edit View Communication Actions Window Help	
8 RR 28 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Host: 192.168.21.102 Port: 23 Work	station ID: Disconnect
Columns : 1 71	Browse
SEU==>	XRADDTRGRS
	. 2+ 3+ 4+ 5+ 6+ 7
0102.00	
0103.00	<pre>// Write the record in XPRBOBJS file</pre>
	exsr zwrtprbobjs;
0105.00	
	dif;
0107.00	
0108.00 endi	f;
0109.00	
0110.00 endif;	
0111.00	
0112.00 read(e	) xtriggers;
0113.00 enddo;	
0114.00	
0115.00 endsr;	
	***************************************
0117.00	
0118.00 // *******	***************************************
	9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat find F	24=More keys
MA MW	04/026
³ ³ ³ ³ ³ ³ ³ ³	

```
<u>File Edit View Communication Actions Window Help</u>
```

Eile Edit View Communication Actions Window Help	
🖻 🔁 😹 🔳 🔳 🗯 😹 🛃 🔮	
Host: 192.168.21.102 Port: 23	Workstation ID: Disconnect
Columns	: 1 71 Browse QRPGLESRC
SEU==>	XRADDTRGRS
	. 1+ 2+ 3+ 4+ 5+ 6+ 7
0120.00	// ************************************
	begsr zwrtprbobjs;
0122.00	
0123.00	<pre>prbcat = 'TRIGGERS';</pre>
0124.00	<pre>prbobj = trfile;</pre>
0125.00	setll(e) (prbcat:prbobj) xprbobjs;
0126.00	if not %equal(xprbobjs);
0127.00	
0128.00	// Write the records
0129.00	write(e) rprbobjs;
0130.00	
0131.00	// Clear the existing records
0132.00	clear rprbobjs;
0133.00	
0134.00	endif;
0135.00	
0136.00	endsr;
F0-F	
	efresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat fin	d F24=More keys
M <u>B</u> A MW	05/016
∰ ¹ 1902 - Session successfully started	

These modifications in the Problem Analysis will be reflected in the Problem Analysis Editor (when taken).

Now, when you select the **Problem Analysis** option, the Edited Category can be seen there.

## **GENERATE PROBLEM ANALYSIS**

Generate Problem Analysis analyzes the application database files and reports problems. Select the **Generate Problem Analysis** option from the **Audit Options** on the context menu of the X-Analysis application. This invokes the following dialog:

#### Generate Problem Analysis dialog

🖨 G	enerate l	Problem /	Analysis	х
X-Ref Libr	rary	XAN	4CDXA	
Remove H	listory	Υ		~
		ОК	Cancel	

You can choose to 'Remove History'. The default selection is 'Y' which deletes the entire history that existed previously. Select 'N' if you want to retain the history.

Click **OK** to invoke the batch job command.

## **VIEW DATABASE SIZE STATISTICS**

**View Database Size Statistics** helps you monitor the growth statistics of a database over a selected period of time. The current aggregate/total database statistics will be displayed for the database and also for individual files on a new editor.

To use this option, below steps need to be executed:

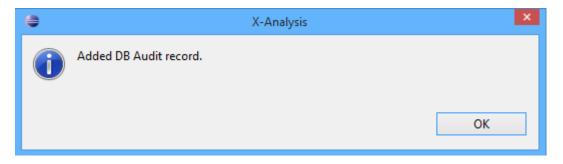
- Double-click on the **Files** node for the Object List.
- Select the files you wish to audit using the Add to Database Auditing option. This option is available only for PF type objects. The following image shows the option.



Object List of *ALI	USR/*ALL/*	FILE/	/PF/*ALL/*ALL, T	otal Objects:	61		🐝 = 🖨 🗵 =			秮
Library	Name		Туре	Attribute	Des	cription		Status	Changed	
PF XAN4CDEM	CONDET	•		55	-	ract Detail		*В	02/07/15	
PF XAN4CDEM	CONDET	<u>ام</u>	Zoom Source			ract Detail new -	CBL Ver. with	*В	14/02/14	
PF XAN4CDEM	CONHDR	<b>.</b>	Data Flow Diag	Iram		ract Header		*В	02/07/15	
PF XAN4CDEM	CPYBKSR		Object Where		•	ol copybooks		*D	14/02/14	
PF XAN4CDEM	CUSF		-		• omer Group:			*В	02/07/15	
PF XAN4CDEM	CUSGRP		Variable Where	Used		omer Groups		*A	14/02/14	
PF XAN4CDEM	CUSTS	-2	Data Model Dia	agram		hases		*В	02/07/15	
PF XAN4CDEM	DDLTBLX		File Field Detail	-				*D	14/02/14	
PF XAN4CDEM	DELIVA			-		ery Areas		*В	14/02/14	
PF XAN4CDEM	DISTS		LFs/Access Pat			ibutors		*A	14/02/14	
PF XAN4CDEM	EVFEVEN		Access Path Di	Access Path Diagram				*D	23/02/15	
PF XAN4CDEM	GENTAB		Consolidated Rules			ric Table File		*D	14/02/14	
PF XAN4CDEM	ITEMS		Programs to C	onsolidate		Master File		*D	15/07/14	
PF XAN4CDEM	LISTS							*A	14/02/14	
PF XAN4CDEM	NAMESIE	Annotate				es Index		*A	14/02/14	
PF XAN4CDEM	ORDSTS		Mark for Docu	menter		r status descripti	on	*A	14/02/14	
PF XAN4CDEM	ORGS		Exclude Constr	onstraints	nisations		*A	14/02/14		
PF XAN4CDEM	PF1WNO	More Info			With No Keys		*D	04/08/15		
PF XAN4CDEM	PF2WNO					With No Keys		*D	04/08/15	
PF XAN4CDEM	<b>PF3WNO</b>	_	Change Histor	·		With No Keys		*D	04/08/15	
PF XAN4CDEM	PF4WNO		Source Compa	re		With No Keys		*D	04/08/15	
PF XAN4CDEM	PF5WNO		View Data			With No Keys		*D	04/08/15	
PF XAN4CDEM	PRODFT	·	Add to Databa			ct Default Steps		*A	14/02/14	
PF XAN4CDEM	PROJECT			63		ects		*В	14/02/14	
PF XAN4CDEM	PROORD		Application Area Options	ation Area Options	•	led Orders		*D	14/02/14	
PF XAN4CDEM	PROTRK		Modernization	Options	•	ect Tracking		*C	14/02/14	
PF XAN4CDEM	PTYPES		UML Options			ucts		*A	14/02/14	

**Object List – Add to Database Audit option** 

After you select the file, the following window will appear confirming the addition of the file.



Hereafter, you have to process the **XSETUPLOG** command from the IBM i screen. The following image shows the **XSETUPLOG** command screen.



			TUPLOG scree	en	
			Session A - [24 x 80]		- 0
le Edit View Communicati					
0 66 45 💷	• • •				
Host: 192.168.21.10	02	Port: 23	Workstation ID:	Disconnect	
		Setup Datab	ase Audit (X	SETUPLOG)	
Type choices	s, press E	inter.			
X-Analysis L			and the second second	Name	
Enable Datab	ase Audit	ing	Y		
Frequency .			M	M=Monthly,Q=Quarte	rly
Punge DB Aud	iit Histor	•y	N		
Number of Da	iys		25	Number	
F3=Exit F4 F24=More key		F5=Refresh	F12=Cancel	F13=How to use this	Bottom display
A		MW			09/037

The Enable Database Auditing is set as N by default. You must change it to Y. Select the other details as required. Press **ENTER**. Specifying the requirements through this screen will ensure that the selected files are monitored for the database growth from the date they have been added after you have initialized the X-Ref.

Now select the **View Database Size Statistics** option from the **Audit Options** submenu. The database size statistics will be displayed as below:



Database Statistics Analysis fo	r XAN4CDXA					
Database Name	Date	Size	No. of Members	Records	Deleted Records	
⊿ ASTATUS						
	2012-07-05	81920	1	15	6	
	2012-09-06	91920	2	20	10	
	2012-12-12	82920	2	17	9	
	2013-05-09	81930	2	18	7	
	2014-12-03	71920	1	15	3	
	2015-08-05	81920	1	15	6	
CNTACS						
	2012-07-05	69632	1	9	0	
	2012-09-06	79632	1	12	2	
	2012-12-12	69932	2	14	6	
	2013-05-09	69638	3	19	2	
	2014-12-03	67632	1	9	0	
	2015-08-05	69632	1	9	0	
CONDET						
	2012-07-05	110592	1	98	8	
	2012-09-06	120592	2	101	17	
	2012-12-12	120592	3	100	10	
	2013-05-09	110792	2	99	9	
	2014-12-03	120592	1	98	5	
	2015-08-05	110592	1	98	8	
CONHDR						
	2012-07-05	122880	1	19	119	
	2012-09-06	132880	1	20	121	
	2012-12-12	122980	3	21	120	
	2013-05-09	123180	3	17	139	
	2014-12-03	102880	1	19	100	
	2015-08-05	122880	1	19	119	
▲ CUSF						
	2012-07-05	303104	1	67	151	
	2012 00 06	212104	2	00	160	

Database Statistics Analysis for XAN4CDXA

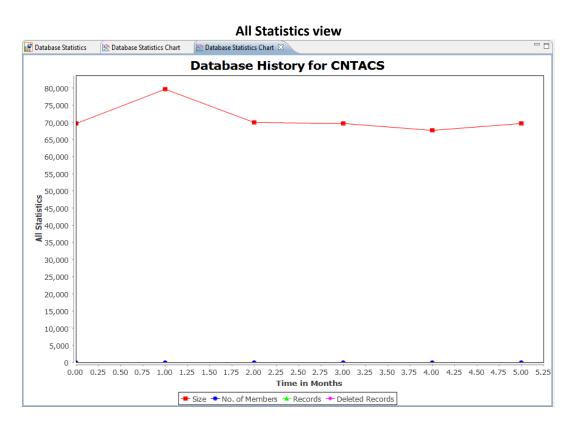
Right-click on the Database Name. More options will appear as shown below:

atabase Statistics Analysis for XAN4	CDXA					
Database Name	Date	Size	No. of Members	Records	Deleted Records	
ASTATUS						
	2012-07-05	81920	1	15	6	
	2012-09-06	91920	2	20	10	
	2012-12-12	82920	2	17	9	
	2013-05-09	81930	2	18	7	
	2014-12-03	71920	1	15	3	
	2015-08-05	81920	1	15	6	
	~		i i i			
All Statistics	2012-07-05	69632	1	9	0	
🖄 Size	2012-09-06	79632	1	12	2	
🖄 No. of Members	2012-12-12	69932	2	14	6	
🖄 Records	2013-05-09	69638	3	19	2	
🖄 Deleted Records	2014-12-03	67632	1	9	0	
	2015-08-05	69632	1	9	0	
▲ CONDET						
	2012-07-05	110592	1	98	8	
	2012-09-06	120592	2	101	17	
	2012-12-12	120592	3	100	10	
	2013-05-09	110792	2	99	9	
	2014-12-03	120592	1	98	5	
	2015-08-05	110592	1	98	8	
CONHDR						
	2012-07-05	122880	1	19	119	
	2012-09-06	132880	1	20	121	
	2012-12-12	122980	3	21	120	
	2013-05-09	123180	3	17	139	
	2014-12-03	102880	1	19	100	
	2015-08-05	122880	1	19	119	
CUSF	20.0 00 00					
	2012-07-05	303104	1	67	151	
	2012 01 05	212104		00	151	

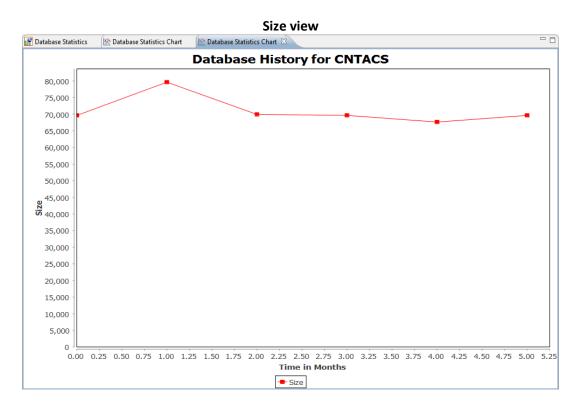
**Context menu showing options - Database Statistics** 

When you click **All Statistics**, the graph will display the entire statistics of the database over the selected period of time.





**All Statistics** can be further split for individual parameters like Size, or No. of records, as specified in the context menu. When you select the **Size** option, the size of the database is plotted as follows:



# **UML Diagramming**

X-Analysis provides various options for UML diagramming on RPG/RPT/SQLRPG types of programs. The following options are available in X-Analysis for UML diagramming:

- Re-generate UML
- Activity Diagram
- Class Diagram

The UML Diagramming options are available on the context menu under the **UML Options** submenu on the Object/Member List.

## THE PRE-REQUISITES

- 1. As a pre-requisite, you need to install the XAUML.msi (XA UML Support).
- 2. Use the Business Rules functionality to re-engineer the programs. The Activity Diagrams will then be generated on the re-engineered program(s).

*Note: The UML functionality works only on the Eclipse 3.4 (provided with the Runtime Environment).* 

#### **RE-GENERATE UML**

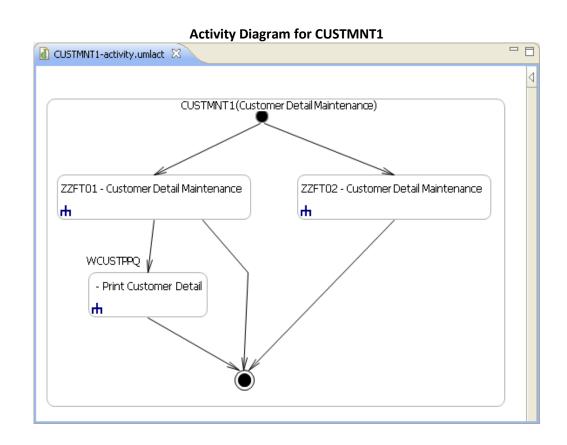
When the **Re-generate UML** option is opted from the **UML Options** submenu available on the context menu over the Object/Member List, then it will generate the Activity Diagram and the Class Diagram for that Object.

#### ACTIVITY DIAGRAM

The Activity Diagram illustrates the dynamic nature of a system by modelling the flow of control from activity to activity. An activity represents an operation on some class in the system that results in a change in the state of the system. Typically, Activity Diagrams are used to model workflow or business processes and internal operation.

Let us see how an Activity Diagram looks for our example. From the tutorial application **XAN4CDXA**, select the **CUSTMNT1** program and opt for the context menu on it, then select the **Activity Diagram** option. This invokes the Activity Diagram as displayed below:





#### **Function Logic**

The **Function Logic** is available as context menu on Activity Diagram. The following screen displays the **Function Logic** options on an Activity Diagram:



1-activity.umlact 🛛	
CUSTMNT1(Customer Detail Ma	intenance)
Add Note	
Eile	- Customer Detail Maintenance
X Delete from Diagram X Delete from Model	
Function Logic	Screen Source Code Class Diagram
	Data Content Screen Actions
	Screen/Report Design
	Migrated Logic
	Business Rules More Info
	Component Documenter Annotate
	CUSTMNT 1 (Customer Detail Ma

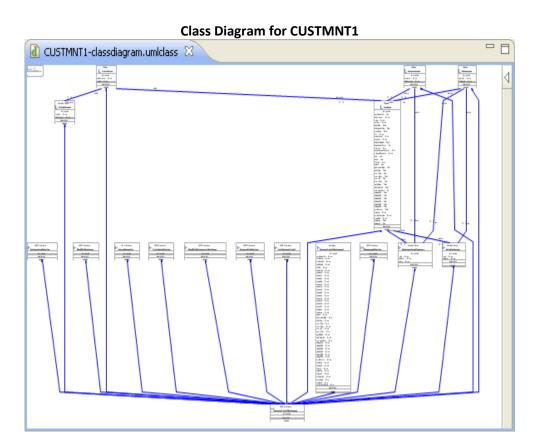
The Function Logic options work correctly when the X-Analysis application library is selected in the X-Analysis Perspective.

## **CLASS DIAGRAM**

The Class Diagram is the backbone of all Object-oriented methods, including UML. The diagram describes the static structure of a system. Classes represent an abstraction of entities with common characteristics. Associations represent the relationships between classes.

Let us see how a Class Diagram looks for our example. From the tutorial application **XAN4CDXA**, select **CUSTMNT1** and opt for the context menu on it, then select the **Class Diagram** option. This action displays the Class Diagram as shown below:





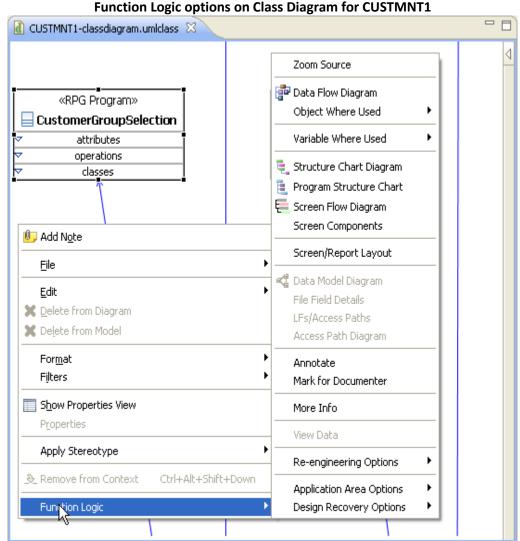
The Class Diagram displays the following:

- 1. Shows all the PF used by the program, and their relationships.
- 2. Joining fields are shown on the edge of the connection.
- 3. All the keys fields and field usage are shown inside the file figure as attribute with their types.

#### **Function Logic**

The Function Logic is available as context menu on the Class Diagram. The following screen displays the **Function Logic** options on a Class Diagram:





#### Function Logic options on Class Diagram for CUSTMNT1

## **RE-GENERATE UML FOR APPLICATION AREA**

The **Re-generate UML** option on an application area generates Activity Diagram and Class Diagram for all objects belonging to the selected application area. Select the MVCPROCESS application area from XAN4CDXA and opt for the context menu on it. Then, select the Re-generate UML option from the UML Options submenu. This generates the Activity Diagram and the Class Diagram for all objects along with the Class Diagram for the selected application area.

# **Data Management Features**

X-Analysis is unique in that it automatically derives the system data model by analyzing both the actual data contents and all programs that use this data to verify the existence of any cross-file relationships. These potential relationships are verified by performing an integrity check to ensure that all data from the dependent file does indeed validly reference data records from the owning file. In this way even the most complex legacy system can be data modelled with relatively no effort.

## **VIEW DATA**

Using the **View Data** option from the context menu, the records of *FILE type objects (PFs and LFs) may be viewed.

On selecting the View Data option, the following Data View is displayed:	On selecting the	View Data option,	the following Data View is di	splayed:
--------------------------------------------------------------------------	------------------	-------------------	-------------------------------	----------

Data View for CUSFL1 🔀								
ata View for CUSFL1						Ē •	13 • 🧘 🦉	
			<b>P</b>					
Company	Distributor	Sts	Last	Next	Fa	Cus. No.	Product Code	-
Bertwhistle & Company Ltd	DT	5	030514	031025	01	00001		
Besson Bros.	DT	7	031102	031125	05	00015		
Beta Company Limited		8	030408	031006		00140		
Bock & Co. Ltd		8	030408	031006	05	00014		-
Cable Installations Ltd.		7	031102	031125		00092		
Carmel Automotive Ltd.		2	030508	031013	15	00100		
Computer Products Ltd		8	030408	031006	01	00118		
Consumer Products Ltd		0	030514	031025	03	00102		
Culver plc		5	030514	031025	04	00139		
Driver Drawdowns plc		9	030908	031013	01	00029		
Express International plc		9	030908	031013	04	00116		
First Chemicals Ltd		3	030514	031025	05	00043		
First Trading Ltd		3	030514	031025	01	00103	XB	~

# **DATA DICTIONARY**

X-Analysis makes the seemingly complicated task of data modelling an easy one. When the data inherent in a specific application is accessible, data modelling can be a straightforward procedure. X-Analysis has the **Data Dictionary** option for this purpose. The Data Dictionary contains detailed information for every field in each file in the application database. Much of this data is the standard metadata extracted for each file and stored on the **XDD** file – for instance field and column names, field size and field type.

Thus, record metadata is readily available for use by other applications.

Click on the Data Dictionary icon available on the X-Analysis toolbar. This will show up the Data Dictionary submenu options. These options are:

- 📆	<del>60</del> -	2	件	 Q
📆 🛗 Ent	ities			
🗋 Ace	tess P	aths		
🛗 Fie	lds			
🍓 Rel	lations	hips		
🔩 Rel	lations	hip D	etails	

#### Data Dictionary menu options

#### **Entities**

LEGACY

The first submenu option is Entities. Select this option to display the Primary Identifiers view. This is also the default view when the Data Dictionary is invoked from X-Analysis.

The identification of the correct primary identifier is crucial to the building of an accurate data model. The primary identifier is determined by an examination of all the access paths for the file and is verified against the data in the file. All the primary identifiers are written to the **XPIDS** file.

<ul> <li>Object List</li> </ul>	🔚 Entities 🛛						
ntities						↓ <u>a</u> + <b>₹</b> *	6 3
	<b>B</b>						
PF NAME	PID FILE	KEY1	KEY2	KEY3	KEY4	KEY5	^
ASTATUS	ASTATUS	STATUS					
CNTACS	CNTLF4	PRPCDE	STATUS	CUSNO			
CONDET	CONDET	XWORDN	XWABCD				
CONDETNW	CONDETNW	XWORDN	XWABCD				
CONHDR	CONHDR	XWORDN					
CUSF	CUSFL3	CUSNO					
CUSGRP	CUSGRP	XWBNCD					
CUSTS	CUSTS	XWBCCD					
DDLTBLXMP	DDLTBLXMP	CUSNBR					
DELIVA	DELIVA	XWBDCD					
DISTS	DISTS	DSDCDE					
EVFEVENT	EVFEVENT	EVFEVENT					
GENTAB	GENTAB	FLDNAM	CODVAL				
ITEMS	ITEMS	#ITEM					
LISTS	LISTS	LSLCDE					

. . . ..... .

The second submenu option is **Access Paths**. This file records all of the access paths available to each Physical File. There is one **XKEYMAP** record for each access path. You can select the **Access Paths** option by clicking on the **Data Dictionary** icon.

Object List	🔚 Access Pat	ths 🛛					
Access Paths						13 - 👗 🖉	2
			<b>B</b>				
FILE NAME	LF NAME	S/O	U/K	KEY FIELDS	REF. FIELDS	FIELD ATTRIBUTES #1	^
ASTATUS	ASTATUS			STATUS		ATUSA00001	
CNTACS	CNTACS			CUSNO PRPCDE		SNO N00005PCDEA00002	
CNTACS	CNTLF1	N		SINIT USERNM		NIT A00003ERNMA00034	
CNTACS	CNTLF2	N		USERNM		ERNMA00034	
CNTACS	CNTLF3	N		STATUS CUSNO		ATUSA00001SNO N00005	
CNTACS	CNTLF4	N	Υ	PRPCDE STATUS		PCDEA00002ATUSA00001	
CONDET	CONDET		Y	XWORDN XWAB		ORDNN00006ABCDA00020	
CONDET	CONDETL1	N		XWAACS XWOR		AACSA00011ORDNN0000	
CONDET	CONDETL2	N		XWABCD XWAA		ABCDA00020AACSA0001	
CONDET	CONDETL3	N		XWABCD XWOR		ABCDA00020ORDNN00006	
CONDETNW	CONDETNW		Υ	XWORDN XWAB		ORDNN00006ABCDA00020	
CONHDR	CONHDR		Υ	XWORDN		ORDNN00006	
<						>	

Data Dictionary – Access Paths

Up to 10 key fields can be associated with each field.

#### Fields

The third submenu option is **Fields**. Select this option to view information for every field in each file in the application database. All the field information extracted during the Data Modelling process is contained in the Data Dictionary file. Each field from each Physical File in **XPIDS** is listed. The metadata extracted can be interpreted and utilized by applications to read, write, and format the fields correctly.

On selecting the **Fields** option, the file fields' details are displayed as shown in the image below:



Object List	🔚 Fields 🛛	X					
ields						13 - 🗶 🖉	
		R					
FIELD NAME	PF NAME	GRID SEQ.	RCD.SEQ.	ТҮРЕ	FLD HEADING	FLD CLASS	1
#DESC	ITEMS	2.0	2.0	D	Description		
#ITEM	ITEMS	1.0	1.0	К	Item #		
#PART	ITEMS	3.0	3.0	К	Part #		
#UOM	ITEMS	5.0	5.0		Weight Unit of Measure		
#WEIGHT	ITEMS	4.0	4.0		Weight		
AACG	XFRF	1.0	1.0		JCPMST AUTO ADD-C/O		
AACM	XFRF	2.0	2.0		AUTO ASSIGN CUST		
AACS	XFRF	3.0	3.0		ADD COST INCOME		
AADO	XFRF	4.0	4.0		AUTO ADD DOC		
AAIT	XFRF	5.0	5.0		AUTO ASS ITM		
AAPO	XFRF	6.0	6.0		JCPMST AUTO ADD-P/O		
AAPS	XFRF	7.0	7.0		POPSHP AUTO ADD-J/		
<						>	

#### Relationships

The fourth submenu option is Relationships. Select this option to view relationships among all the PFs that form the Data Model as the files contained in an application could be inter-related. For executing the data modelling procedure, it is imperative to have information of all these relationships.

<ul> <li>Object List</li> </ul>	🔚 Relations	hips 🛿					
Relationships					Ē - ↓	2 - T T	5
OWNING PF	DEP. PF	DEP. LF	DEP.SEQ.	R.TYPE	OWNING PF TEXT	RELN.ID	1
ASTATUS	CNTACS	CNTLF3	1.0		Status file	00102	
ASTATUS	CUSF	CUSFL2	2.0		Status file	00114	
CONDET	PROJECT	PROJECL5A	1.0		Contract Detail	00126	
CONDET	TRNHST	TRNHSTL6	2.0		Contract Detail	00144	
CONDETNW	PROJECT	PROJECL5A	1.0		Contract Detail new -CBL V	00127	
CONDETNW	TRNHST	TRNHSTL6	2.0		Contract Detail new -CBL V	00145	
CONHDR	CONDET	CONDET	1.0	0	Contract Header	00104	
CONHDR	CONDETNW	CONDETNW	2.0	0	Contract Header	00108	
CONHDR	PROJECT	PROJECL5A	3.0		Contract Header	00128	
CONHDR	TRNHST	TRNHSTL6	4.0		Contract Header	00146	
CUSF	CNTACS	CNTACS	1.0		Sites	00101	
CUSF	CUSTS	CUSTSL3	2.0		Sites	00118	

**_.**... 

There are three types of relationships that can be identified:



- Owns PID to PID relationship
- Accesses Access Path to Access Path relationship
- Refers to Foreign key to PID relationship

When you right-click on an object, besides the Variable Where Used functionality, you get two more options on the context menu – **Joint Where Used** and **Where Extracted**. These options are shown in the screenshot below:

🔓 Relationships			- D
Relationships		Ē • .	lg - 🍸 🗞 蜜
OWNING PF	DEP. PF	DEP. LF	DEP.SE ^
CNTACS		ORDSTS	1.0
CONHDR	Variable Where Used	·	1.0
CUSF	Joint Where Used		3.0
CUSF	Where Extracted		2.0
CUSF	SECF	_	1.0
CUSF	SECF		1.0

Context menu showing Joint Where Used and Where Extracted options

The details for these features are as follows:

- Joint Where Used: Displays the list of programs with the Join Usage of the Owning file and Dependent file.
- Where Extracted: Displays the origin program and relationship details. The Origin program is the program of X-Analysis product where the relationship was extracted in the Data Model build process. The information of "Where Extracted" is further used in the data modelling process.

#### **Relationship Details**

The last submenu option is **Relationship Details**. Select this option to view the detailed composition of every File-to-File relationship. This file is the counterpart to **XRELS** and every File-to-File relationship is recorded in **XRELS**. **XSHKEYS** describes each of the Field-to-Field relationships that make up these **XRELS** relationships.

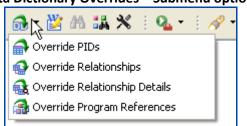


Object List	🔚 Relationshi	p Details 🛛					
Relationship Det	tails				Ļ	2 - 7 7	5
		<b>•</b>					
OWN. PF	DEP. PF	DEP.PF FLD	OWN.PF FLD	KEY SEQ.	CONSTANT	RELN.ID	1
ASTATUS	CNTACS	STATUS	STATUS	1.0		00102	
ASTATUS	CUSF	STATUS	STATUS	1.0		00114	
CONDET	PROJECT	XWORDN	XWORDN	1.0		00126	
CONDET	PROJECT	XWABCD	XWABCD	2.0		00126	
CONDET	TRNHST	XWORDN	XWORDN	1.0		00144	
CONDET	TRNHST	XWABCD	XWABCD	2.0		00144	
CONDETNW	PROJECT	XWORDN	XWORDN	1.0		00127	
CONDETNW	PROJECT	XWABCD	XWABCD	2.0		00127	
CONDETNW	TRNHST	XWORDN	XWORDN	1.0		00145	
CONDETNW	TRNHST	XWABCD	XWABCD	2.0		00145	
CONHDR	CONDET	XWORDN	XWORDN	1.0		00104	
CONHDR	CONDETNW	XWORDN	XWORDN	1.0		00108	

# **DATA DICTIONARY OVERRIDES**

The elaborate Data Modelling process demands the presence of several details. Select the **Data Dictionary Overrides** menu to access detailed information for every field in each file in the application database. Much of this data is the standard metadata extracted for each file and stored on the **XDD** file – for instance field and column names, field size and field type. Thus, record metadata is readily available for use by other applications. The drop-down icon for this option is present alongside the **Data Dictionary** icon on the X-Analysis toolbar.

The Data Dictionary Overrides submenu options are:



#### Data Dictionary Overrides – Submenu options

#### **Override PIDS**

The first submenu option is **Override PIDs**. Click this option to display the **XOVRPIDS** file which contains all the override entries for the **XPIDS** file.

Field	Field Name	Size	Description
Physical File Name	OVRPF	10A	
PID File Name	OVRPID	10A	Access Path for file to be used as the PID
Relationship Priority	OVRPTY	1A	Only 1, 2 & 3 signify; 1 is the highest – this value is used when determining which "owner" file is to supply the descriptor for screen layouts.
Reference Only	OVRRFO	1A	If this relationship is reference only, enter "y".

The screenshot below displays the Override PIDs fields.

Data Dictionary Overrides– Override PIDS						
指 Object List	🔚 Data View for XOVRPIDS 🕺	-		- 8		
Data View for XOV	RPIDS		12 - 🖽 🗙 🦷	1 🐻 🖢		
PF NAME	PID FILE NAME	RELN. PRIORITY	REFERENCE ONLY			

#### **Override Relationships**

**Override Relationships** is the next option on the **Override Data Dictionary** menu. Select this option to display the **XOVRRELS** file, which holds the override entries for **XRELS**.

Field	Field Name	Size	Description
Owning PF	OVROPF	10A	
Dependent PF	OVRDPF	10A	
Dependent LF	OVRDLF	1A	
Reference Type	OVRRFO	1A	

The following screen displays the Override Relationships window.



Object List	🔚 Data View for XOVRRE	LS 🛛		
Oata View for XOV	RRELS	🖷 - 🐙 - 🖽 🗙 🦷	16	
			<b>P</b>	
OWNING PF	DEPENDENT PF	DEPENDENT LF	R. TYPE(O/Y/ /D/E)	

## **Override Relationship Details**

The next submenu option is **Override Relationship Details.** Select this option to display **XOVRSHKS** file which contains the override entries for the **XSHKEYS** file.

Field	Field Name	Size	Description
File	OVRFIL	10A	
Match File	OVRMFIL	10A	
Key Seq.	OVRSEQ	5P 2	
Field	OVRFLD	10 A	
Match Field	OVRMFLD	10 A	
Constant	OVRCON	20 A	
Relationship ID	OVRRLID	5P 0	



Data View fo	or XOVRSHK	s			↓2 - 👪 )	< 7 6
					E	}
OWN. PF	DEP. PF	DEP. LF	KEY SEQ.	OWN. PF FLD	DEP. PF FLD	CONSTANT
<						3

# **Override Program References**

The last option is Override Program References. Select this option to add or remove program references for a specific object.

Data Dictionary Overnues – Overnue Program References					
🕹 Object List 👘 🚺 Dat	a View for XOVRPGRF 🕺				
Data View For XOVRPGR	F	😅 🖨 🗵 👻	AA -		
Calling Program	Called Program	Add/Remove			

#### Data Dictionary Overrides – Override Program References

## **VERIFY DATA RELATIONSHIPS**

The Verify Data Relationships option is a submenu option of the Data Management Options, which is available on the context menu of a selected application area. Clicking the Verify Data Relationships option brings up a dialog showing the selected crossreference library and application area.



	Verify Data Re	elat	ionships
😑 🧕 🖉	WCPROCESS - Re-Engineering		1
<b>.</b>	Application Area Options	•	
	Derive Business Rules		
	Export Options	۲	
	Annotate		
_	Document Application Area		
	Data Management Options	•	Verify Data Relationships
	Test Management Options	۲	Subset/Archive Filter が Subset Data
	Reengineer Programs		Archive Data
	Generate Programs		Purge Data
	Generate Web Services		Archive & Purge Data
	Generate Data Application		
	Data Migration		
	Audit Options	×	
	UML Options	•	

This presents a dialog showing the selected cross-reference library and the application area.

#### Verify Data Relationships dialog

🖶 Verify Data Relationships 🛛 🛛 🔀				
X-Ref Library	XAN4CDXA			
Application Area	MVCPROCESS			
Maximum Error Allowed	þ			
OK Cancel				

It prompts for maximum records in error to be reported, showing the primary keys and the foreign keys of each record that breaches a given relationship. This can range from 1 to 999.

If the request is successful then the job gets submitted and the job details are displayed. On completion, a **Verification** node gets added under the application area.



# WVCPROCESS - Re-Engineering WVCPROCES1 Werification Application Area Diagram Cata Model Diagram Area Flow Diagram Area Flow Diagram Area Flow Diagram Area Flow Diagram Files Files

#### Verification node under Application Area

#### **Verification Process**

The **Verify Data Relationships** option submits the **XVERIFY** command in batch. The **XVERIFY** command uses the data model constructed by re-engineering, to automatically verify that all application data satisfies the relationships deduced by the data model.

The product examines each data record in turn to see if its referential integrity relationships are satisfied. Each integrity relationship that is breached is separately reported on in a comprehensive audit print produced by the product.

This command is used to verify the data model against the data in the database.

#### Parameters

The parameters passed internally to the **XVERIFY** command are:

#### **Re-engineering Function Library**

It is the library which contains the data model and application-specific files created by the command **XA4MODEL**. This is the name of the library that was entered as the Function Library on the **XA4MODEL** command.

#### **Database Library Name**

The library name, which contains the application database files. The command submitted with the value ***LOADLIB**, implying, each database file should be located in the same library used when **XA4MODEL** was run.

#### X-Analysis Application Area

The command uses the application area, on which this option is invoked, to control which files in the data model should be verified. Only relationships among files in the specified

application area will be verified. Since an application area has been specified, the X-Analysis cross-reference library too is passed as parameter to the command.

#### Run Mode

The Run Mode parameter is passed as ***REPORT**, implying, generate a report showing the primary keys and the foreign keys of each record that breaches a given relationship up to a maximum number for each relationship as specified by the Maximum records parameter.

#### Maximum Records

If you have selected a run mode of ***REPORT** then **XVERIFY** will print a report showing the primary keys and the foreign keys of each record that breaches a given relationship. This parameter allows you to specify the maximum number of records printed for each relationship.

If a dependent file contains fewer than the maximum number of records specified (but more than zero records) and all the records breach the relationship, then that relationship will be updated.

#### Verification Report

Opt for the context menu on the **Verification** node under the selected application area; select the **Orphaned Records** option. This generates a report displaying the primary keys and the foreign keys of each record that breaches a given relationship.



Orphaned Record	5 25			- 6
Orphaned Records	<b>Report For</b>	Subset Data Library MVCPROCE	55	â 🛛 •
File/Owner	Total	Primary Key	Foreign Key	
CUSTS	0			
CUSF	0			
CUSGRP	0			
<ul> <li>DISTS</li> </ul>	0			
SLMEN	0			
		Relationship verified.		
CONDET	9			
CONHDR	5			
		XWORDN-XWABCD;3-000080	XWORDN:3	
		XWORDN-XWABCD: 4-000083	XWORDN:4	
		XWORDN-XWABCD: 5-000031	XWORDN:5	
		XWORDN-XWABCD: 5-000083	XWORDN:5	
		XWORDN-XWABCD:7-000083	XWORDN:7	
<ul> <li>STKBAL</li> </ul>	4			
<ul> <li>STKMAS</li> </ul>	0			
STOMAS	0			
TRNTYP	0			
<ul> <li>STKBAL</li> </ul>	0			
CONHDR	0			
CUSF	0			
TRNHST     TR	10			

#### Verification Report

# SUBSET/ARCHIVE FILTER

The subset selection criteria can be understood as the filter criteria specified on the Physical File(s) under an application area to select records to subset. On the **Subset/Archive Filter Criteria** dialog, pick the file in the drop-down to add/update filter criteria.



	Sub	oset/Archive I	Filter Criteria	dialog	
🛢 Subset/Archi	ve Filter Criteri	a (MVCPROCES	S)		X
Filter Criteria Boolean	Field Name	Physical Files Oper	- SELECT - SELECT - CONDET CONHDR CUSF CUSGRP	Field Value	
Query Viewer				Save	Return

This lists the filter criteria defined on the file, if any. An add row is provided to add a new criterion.

Filter Criterion	Description
Boolean IF AND OR	<b>Boolean Column</b> The default value is 'IF'. For the second line, one can select from AND/OR.
Field Name Cus. No. Company Distributor Sts Last Cnt Date	<b>Field Name Column</b> This column lists the fields of the Physical File picked. Pick the field on which the criterion is to be created.
Operator Fie Choose operator Less than (LT) Less than OR Equal to (LE) Equal to (EQ) Greater than OR Equal to (GE)	<b>Operator Column</b> Pick the operator to apply

Filter Criterion	Description
Field Value	Field Value
	Supply the field value against which the field is to be compared.

Click Save to save the filter criteria. Click Return to present the display dialog, listing the filter criteria specified for the application area.

# **SUBSET DATA**

The Subset Data option creates complete test data subsets from live data based upon existing application data model. Subset Data uses the data model constructed by X-Model to produce test data sets that satisfy all the constraints of the data model. The product first takes a specified number of records from each client file, and then examines each data modelling relationship in turn to check that all referenced records are also included.

Creating test data sets is a three-stage process.

- Define the application area using the X4WRKAPP/X-Analysis.
- Define the filter using X-Analysis.
- Take the Subset Data option on the application area.

#### **Creating Subset Data**

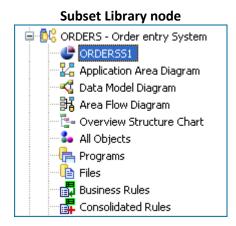
Select the application area **ORDERS** from the tutorial application, **XAN4CDXA**. Select the Subset Data option from the Data Management Options submenu, available on the context menu on application areas. The Subset Data option brings up the Subset Data dialog, as shown below:

Subset Data dialog				
🖨 Subset Data				
X-Ref Library	XAN4CDXA			
Application Area	ORDERS			
Subset Library	ORDERSS1			
Include Owners	*YES 🔽			
Include All Dependents	*NO 🔽			
Replicate Triggers/Constraints	*NO 🔽			
Data Option	*REPLACE 🔽			
ОК	Cancel			

The **Subset Data** dialog prompts for the following options:

- Subset Library: Library to hold the subset records
- Include Owners: Select from *YES (default value), *NO, *ALL
- Include All Dependents: Select from *NO (default value), *YES, *ALL
- **Replicate Triggers/Constraints:** Select from *NO (default value), *Yes
- **Data Option:** Select from *REPLACE (default value), *ADD

After making the choices, click **OK** to execute the batch server command, **XSUBAREA**. This produces the subset library, as the name specified in the **Subset Data** dialog. The records on the file obey the subset filter criteria specified on the files under the application area. This also adds the subset library – **ORDERSS1** as a node under the application area node in the navigation view.



# **ARCHIVE DATA**

According to its name, the **Archive Data** option helps you in archiving data, thus supporting application development and maintenance work. Select the option from **Data Management Options** submenu to invoke the following dialog.



Archiv	ve Data dialog
🖨 Archive Data	
X-Ref Library	XAN4CDXA
Application Area	ORDERS
Archive Library	ORDERSA1
Subset Library	ORDERSS1
Archive mode	*gensbs
Delete live data	*NO
Database library name	*LOADLIB
	OK Cancel

The dialog prompts you to supply the following details:

- Archive Library: Name of the Archive Library
- **Subset Library:** Name of the Subset Library
- Archive mode: Select from *GENSBS (default value), *ARCDTA, *BOTH

After providing the details, click **OK** to submit a batch job.

Batch Job F	Progress view
-------------	---------------

C Progress 🛛	×
XARCASS/SKHAN/668944	
<u>*JOBQ</u>	

At any point, while the batch job is running, click on the hyperlink (*JOBQ) to view the Job Log. The Job Log view is shown below:



Batch Job details	
🗢 Archive Data - Log	×
Archive Data	
Command: XARCASS XA4AREA(ORDERS) XA4LIB(XAN4CDXA) ARCLIB(ORDERSA1) SBSLIB(ORDERSS1) ARCMODE(*GENSBS) DLTDTA(*NO DBASELIB(*LOADLIB)	))
Job Log	
- Tue Dec 02 13:40:10 IST 2014: XARCASS ARCMODE(*GENSBS) ARCLIB (ORDERSA1) SBSLIB(ORDERSS1) DLTDTA(*NO) XA4LIB(XAN4CDXA) XA4AREA(ORDERS) DBASELIB(*LOADLIB) - Tue Dec 02 14:12:22 IST 2014: Job Completed	^
	~
	OK

# **PURGE DATA**

Select the Purge Data option from Data Management Options to eliminate superfluities, and further streamline the data. The following dialog with available details is invoked:

Purge	e Data dialog
🖨 Purge Data	
X-Ref Library	XAN4CDXA
Application Area	ORDERS
Archive Library	ORDERSA1
Subset Library	ORDERSS1
Archive mode	*ARCDTA
Delete live data	*YES
Database library name	*LOADLIB
	OK Cancel

#### Data ام:ما _

LEGACY

The **Purge Data** dialog is the same as the **Archive Data** dialog. However, note that the default Archive mode is *ARCDTA (you can change it to *BOTH), and the Delete live data is pre-set as *YES.

Click **OK** to submit a batch job. The details appear on screen as shown below:

Batch Job details	
🚔 Purge Data - Log	×
Purge Data	
Command: XARCASS XA4AREA(ORDERS) XA4LIB(XAN4CDXA) ARCLIB(ORDERSA1) SBSLIB(ORDERSS1) ARCMODE(*BOTH) DLTDTA(*YES) DBASELIB(*LOADLIB)	
Job Log	
- Tue Dec 02 15:28:10 IST 2014: Job Completed	
	/
ОК	

# **ARCHIVE & PURGE DATA**

Select the **Archive & Purge Data** option from **Data Management Options** to invoke the following dialog (similar to the **Subset/Filter Criteria** dialog).



Archive & Purge data		urge Data dialog	
Filter Criteria	Physical Files	- SELECT - 💌	
Field Name	Operator	Field Value	Boolean
Query Viewer			
			A
Archive Purge data		Archive	Data Purge Data

Filter Criterion	Description
Field Name Cus. No.	<b>Field Name Column</b> This column lists the fields of the Physical File picked. Pick the field on which the criterion is to be created.
Operator Fi Choose operator Choose operator Less than (LT) Less than OR Equal to (LE) Equal to (EQ) Greater than OR Equal to (GE)	Pick the operator to apply.
Field Value	<b>Field value</b> Supply the field value against which the field is to be compared.
Boolean IF AND AND OR	<b>Boolean Column</b> The default value is 'AND'. The other option is 'OR'.

#### Archive & Purge Data dialog

# **Exporting & Printing**

Modern software design tools frequently offer the facility to re-engineer a data model or entity relationship diagram from an existing database. This is usually done over an Open Database Connectivity (ODBC) connection and relies on the metadata held within a database to describe the relationships between tables. These tools are often unable to reengineer an accurate data model from an existing DB2 database because it predates the database features that the tool relies on. You can use the X-Analysis data model to bridge this gap and import your data model into other tools.

X-Analysis provides various export options for exporting diagrams and technical details directly to applications such as PDF/Microsoft Word or Microsoft Visio.

The interface to PDF/Microsoft Word is sophisticated enough to automatically produce detailed and structured documents that have Contents & Index pages, chapters, sections and all of the screens available in X-Analysis, displayed with a simple selection wizard. Existing documentation, object/field annotation can be included in the exported PDF/Microsoft Word documents.

#### EXPORT TO PDF

Selecting the **Export to PDF** option from the **Export Options** icon available on the toolbar to export the content to the PDF format.

						- view of		101100		ac		
🖹 X-Ar	nalysis -	Source L	ist of C	ON	001	in XAN4CD	EM-Q	RPGSRC,	Lines-206	, View Leve	l-4.1.pdf 🔳 🕻	
ile Edi	it View (	Document	Comme	ents	For	ms Tools A	dvanc	ed Windov	/ Help			
	86					🄶 🔟 / '	7	IN 🖑	, C	9 📀 🚺	)% 🕶 😝	
Find		•										
										-	206, View Level: 4	
	Seq No 0001.0		. 1 * US	+		+ 3 10/05/04 A0				6+ 7	+ 8+ 9	
	0001.0		<pre>x US CON001D</pre>	DOR		10/05/04 40	00000	WORKSTN	.ng			
	0003.0			e C e	2				RRN1 KSFIL	C OF CEL		
<i>y</i>	0003.0		CUSTS	IF	Е	K		DISK	RRNI ROFIL	LOLOFI		
	0004.0		CONHDR	UF	E	K		DISK		A		
?	0005.0		CONDET	UF	E	K		DISK		A		
<u> </u>	0007.0		STEMAS	IF	E	K		DISK		*		
	0008.0		STOMAS		E	K		DISK				
	0009.0			IF	E	ĸ		DISK				
					E	ĸ		DISK				
	0010.0		TRNHSTL *	215	F							
	0011.0	00 F	*	218	-		1			MD Key Data		
I	0011.0	00 F	*	215	F	СМД	1	3 78		CMD Key Data		
	0011.0 0012.0 0013.0	00 F 00 E 00 E	*				ı			CMD Key Data		
	0011.0	00 F 00 E 00 E	*		SDS		1	3 78	TINE \$ROUT	CMD Key Data		

#### PDF view of current Source Code

# **EXPORT TO MICROSOFT WORD**

Select the **Export to Microsoft Word** option from the **Export Options** icon available on the toolbar to export the content to the Word format.

Microsoft Word view of Current	Source Code
--------------------------------	-------------

and by															
💾 Document1 - Microsoft Word															
Eile E	Edit	⊻iew	Insert	F <u>o</u> rmat	<u>T</u> ools	RC	s	T <u>a</u> ble	<u>W</u> indo	w H	elp				
10	2		2   ABC	X   X		2 🤜	8	<b>-)</b> - (	(SI +	🥠 🗉			ð   🗸	100%	- 🕜
4	Normal +	- Couri 👻	Courier	r New	-	10 🗸	I	B <i>I</i>	U				i ‡≣ ·	-   <u>1</u> = :	
L			. 8 .		· 1		· 1	:	2		· · 3		1.1.1	· · 4 ·	
				.F.	1		- 4		1		1		9	1	1
			•	s - Sou											
						.+	. 2								+
		001.00		* US			-	10/03	5/04	AOC	00002		test	_	
	_	002.00 003.00	-	FCONC F	0101	CF	Ε					WO.	RKSTN	-	RCETLE
		003.00		r FCUSI	re	IF	E			к		DI	≃v	GKKNI	KSFILE
		004.00		FCONE		UF	E			ĸ		DI			
		006.00		FCONI		UF	E			ĸ		DI			
		007.0	-	FSTK		IF	E			ĸ		DI			
		008.00		FSTO		IF	Ē			ĸ		DI			
		009.00		FSTKE		IF	E			ĸ		DI			
		010 0	n	FTRM	ISTL:	2 T F	F			ĸ		DT	SK		

# **EXPORT TO MICROSOFT EXCEL**

X-Analysis displays various lists. All lists have the options to export data to MS Excel and MS Word. The **Export Options** drop-down icon appears on the associated toolbar.

Select **Export to Excel** and export current source code in the MS Excel format, as displayed below:



	Microsoft Excel view of Current Source Code									
Microsoft Excel -	- X-Analysis - Source List of CON001 in XAN4CDEM1-QRPGSR 🔳 🗖	X								
Eile Edit View	w <u>I</u> nsert F <u>o</u> rmat <u>T</u> ools <u>D</u> ata <u>W</u> indow Contrib <u>u</u> te <u>H</u> elp Ado <u>b</u> e PDF .	- 8 ×								
🗄 🔛 🍟 🗄 Arial	• 10 •   B I U   喜喜喜國  \$   譚  🎚 • 🖄 • 🚣 ·	- II -								
🛅 🔄 🖄 📿 🏊 🍇   📨 🏷   🖉 🔩 🚱   🕅 Reply with Changes End Review 💂										
SnagIt 🛃 Window 🗸 🚽										
A2 🔻	fx									
A	В	~								
1 X-Analysis	is - Source List of CON001 in XAN4CDEM/QRP	G								
2										
3 Seq No *	+ <b>1</b> + <b>2</b> + <b>3</b> + <b>4</b> + <b>5</b> +									
4 0001.00	* US 10/05/04 A0000002 testing									
5 0002.00	FCON001DFCF E WORKSTN									
6 0003.00	F @RRN1 KSFILE OESFL									
7 0004.00	FCUSTS IF E K DISK									
8 0005.00	FCONHDR UF E K DISK A									
9 0006.00	FCONDET UF E K DISK A									
10 0007.00	FSTKMAS IF E K DISK									
11 0008.00	FSTOMAS IF E K DISK									
12 0009.00	FSTKBAL IF E K DISK									
13 0010.00	FTRNHSTL2IF E K DISK	_								
14 0011.00	F*	_								
15 0012.00	E CMD 1 378 CMD Key Data	_								
16 0013.00	E*									
17 0014.00	I SDS									
18 0015 00 I I I I I I I I I I I I I I I I I I		Ť								
Ready		] .:								

# EXPORT TO FLOWCHART

X-Analysis generates Flowcharts for RPG, RPGLE, and COBOL programs. It also generates Process Flow Diagrams for CL programs. The **Flowchart** option is enabled only in the source browser view. It generates the flowchart of the displayed program using MS Visio.

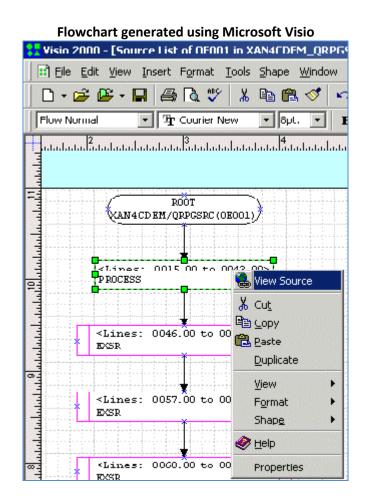
Each level of source (selected source member) has a different flowchart:

- Level 1-2 will have a Flowchart without any code
- Level 3-4 will have a Flowchart with code without blank lines, and with no comments
- Level 5 will have a Flowchart with full code and comments

In Level 1-2 the context menu on a shape in the Flowchart has the option: View Source

The **View Source** option displays the code for that section of the flowchart in the form of an HTML page.



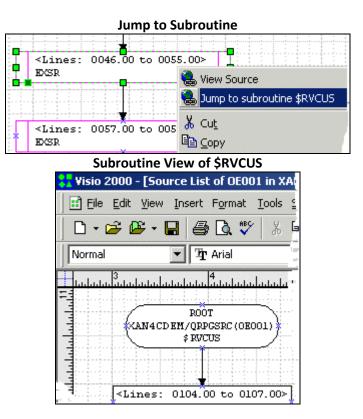


#### Source Code generated in HTML

🔮 E:\Program Fi	iles\Databorough\X-Analysis\Temp\314154114\Source Lis 💶 🗖 🗙
File Edit Vie	ew Favorites Tools Help 🛛 🥂
🛛 🌀 Back 🝷 🌘	🕥 - 💌 💈 🏠 🔎 Search 🤺 Favorites 🚳 Media 🍡
Address 🔂 E:\P	Program Files\Databorough\X-Analysis\Temp\314154114\0015.00 🔽 🛃 Go
0015.00	C*************************************
0016.00	C* RECEIVE PARAMETERS
0021.00	C* UNTIL F3
0024.00	C* INITIALISE SCREEN
0032.00	* RETRIEVE LAST ORDER NUMBER
0043.00	C CALL 'CUSLET'
0046.00	C* GET ORDER NO. & CUSTOMER NO.
0051.00	C* SO LONG AS EXIT NOT REQUESTED #1
0054.00	C* RETRIEVE CUSTOMER DETAILS
0055.00	C EXSR \$RVCUS
•	
🛃 Done	My Computer



The right-click menu option **Jump to subroutine** on EXSR (Execute Subroutine) boxes opens the flowchart for the selected subroutine. This option is available at all levels.



# PRINTING FROM X-ANALYSIS

X-Analysis allows printing of various List/Diagrams/Source members. The **Print** icon is available on the toolbar of various list/diagrams/source members.

Note that the Printer should be already configured.

## **EXPORT AS DDL FROM X-ANALYSIS**

The **Export as DDL** option exports data model information as Data Definition Language (DDL) to the application folder. This information may be used by any database management system e.g. Oracle or SQL Server to create a similar data model.

The Data Definition Language (DDL) is a sequence of Structured Query Language (SQL) commands that defines the structure of a database. X-Analysis can export the structure of an application or application areas as DDL. The DDL can be used to recreate a database on any SQL database system. If your modelling tool does not support XML, then you can use the **Export as DDL** option. This option recreates your database as SQL tables with complete metadata information, required for a tool to re-engineer the new database over ODBC. Some third-party modelling tools allow importing SQL scripts or DDL files directly.

LEGACY

To export the DDL for the example Tutorial System (**XAN4CDXA**) data model:

- 1. Open **XAN4CDXA** from the X-Analysis Client.
- 2. Opt for the context menu on XAN4CDXA, and then select the Export as DDL option from the Export Options submenu.

	Export a	s DI	DL option
⊿ 🔥 XAN4C	DXA - XAN4CDEM Tutorial System		
24 V	New Application Area Add Alternate Data Library List Reset Library List Application Library List		
	Affinity Comparison		
	Refresh Options Derive Business Rules	•	
	Import Options	•	
	Export Options	•	Export as DDL
⊳ ∎	Document Entire Application Document Changed Objects		Export as Web Query Metadata Export as Web Query Application Export Business Rules as XML
	Reengineer Programs Generate Programs Generate Web Services		Convert DDS to SQL Generate Database Service Programs

X-Analysis then invokes Generate DDL dialog as displayed below:



Generate DDL dialog
🖨 Generate DDL 🛛 🛛 🔀
Select the model objects that you want to include in the DDL script.
✓ Tables
Primary Key Constraint
🗹 Foreign Key Constraint
Indexes
Views
Use Long Name for Tables and Fields
Include Default value for Column
Ignore Files starting with
Format Generic 🔽
OK Cancel

Make choices from the Generate DDL dialog and click OK to start the process.

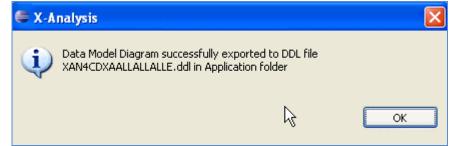
X-Analysis displays the following confirmation dialog to get confirmation from the user and start the process:

DDL	Export	confirmation	dialog

🖶 X-Analysis	
DDL export might take a while! Do you want to proceed?	
	OK Cancel

After the process is over, X-Analysis displays a successful message dialog.

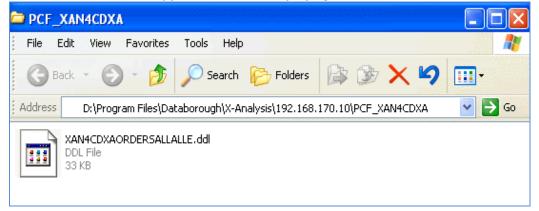
### **DDL Export completion dialog**



LEGACY

To view exported DDL statements, select menu **X-Analysis > Open Application Folder**. The generated DDL file is listed in this folder.

Application	Folder	display	ving	.DDL	File
/ ppiloution	i olaci	aispia			



DDL is plain text and human readable so you can view the file in any text, such as Notepad. The snippet of the DDL statement generated is displayed below:

#### DDL File in Notepad

📕 XAN4CDXAALLALLALLE.ddl - Notepad		×
File Edit Format View Help		
<ul> <li>Data Description Language for</li> <li>Generated using</li> <li>DDL Format</li> <li>Date of Generation</li> </ul>	XAN4CDXA X-Analysis Version 9.1.28 Generic Jan 4, 2011 11:13:54	
CREATE TABLE ASTATUS ( STATUS char(1) NOT NULL , STSTXT char(30) );		
ALTER TABLE ASTATUS ADD CONSTRAINT ASTATUS_keys 1	PRIMARY KEY(STATUS);	
CREATE TABLE CNTACS ( CUSNO decimal(5, 0) NOT NULL USERNM char(34) , PRPCDE char(2) NOT NULL , TELNO char(17) , FAXNO char(15) ,	· ,	>

Note: The Export as DDL option is also available on application areas.

# **CONVERT DDS TO SQL**

The **Convert DDS to SQL** option calls the IBM i command, **XDDSTOSQL** and submits the job in batch. This option is available on cross-reference library, Application Areas, and Physical Files (PF).

LEGACY

Opt for the context menu on the tutorial application, and then select the **Convert DDS to SQL** option from the **Export Options** submenu. The following dialog appears:

Convert DDS to SQL dialog on cross-reference library

Convert DDS to SQL		
X-Ref Library	XAN4CDXA	
Application Area	*ALL	
New Database Library	XAN4CDXAD1	
Compilation Type	*INLINE	
OK Cancel		

Click **OK** to start the process of conversion.

Opt for the context menu on the application area **ORDERS** and select the **Convert DDS to SQL** option under the **Export Options** submenu. The following dialog appears:

# Convert DDS to SQL dialog on application area

Convert DDS to SQL	
X-Ref Library	XAN4CDXA
Application Area	ORDERS
New Database Library	ORDERSD1
Compilation Type	*INLINE
OK Cancel	

The New Database Library contains the generated SQL Objects.

# XDDSTOSQL command

The **XDDSTOSQL** command will initiate the following sequence:

- Generate DDL source members for the PFs. ("CREATE TABLE")
- Amend the DDL source members to specify the new library and SQL table name.
- Run RUNSQLSTM over the DDL source members to create the tables.
- Create a copy of original PFs as LFs pointing to the new SQL table.
- Generate DDL source members for the LFs. ("CREATE INDEX")

- Run RUNSQLSTM over the DDL source members to create the indexes.
- Create a copy of original LFs as LFs pointing to the new SQL table, but using the format of the PF. (These will use the access paths of the indexes.)
- Copy data from the original PFs to the new SQL tables.

#### Working of XDDSTOSQL command

With the help of the **XDDSTOSQL** command one can run all original application software immediately on the new database with no level check problems.

The DDL source for the SQL tables and indexes are stored in **QDDLSRC** in the X-Analysis library. The DDS source for the new LFs is stored in **QDDSSRC** in the X-Analysis library.

The new SQL tables are named using the maximum number of first characters from original PF name which together with the specified suffix are not more than ten characters. The new SQL indexes are named in the same way.

This suffix is specified in the **XSQLCVSFX** data area.

Display Data Area		
	System:	DBS525B
Data area : XSQLCVSFX		
Library : XAN4CDXA		
Type : *CHAR		
Length : 10		
Text XDDSTOSQL SQL Table Name Suffix		
Value		
Value		
Offset *+1+2+3+4+	5	
0 'XQ '		

The converted DDS source members can be flagged in columns 1 to 5. This flag is specified in the **XSQLCVFLG** data area. If the data area is blank or missing, then columns 1 to 5 are not changed.

Display Data Are	sa System: DBS525B
Data area : XSQLCVFLG	
Library : XAN4CDXA	
Type : *CHAR	
Length 5	
Text XDDSTOSQL Source B	lag
Value	
Offset *+1+2+3	+4+5
0 'XDSCV'	

Certain run time values used in the generation of the DDL source are stored in data area – **XSQLCVPMS**.

#### Data Area XSQLCVPMS



	Display Data Area		
		System:	DBS525B
Data area .	: XSQLCVPMS		
Library .	XAN4CDXA		
Туре	••••••••••••••••••••••••••••••••••••••		
Length	· · · · · · · · 100		
Text	XDDSTOSQL Run Parameters		
	Value		
Offset	*+1+2+3+4+	5	
0	'*AS400*SQL*JOB*JOB *ISO*JOB *PERIOD*YES*PRE	FIX'	
50	'N*YES	'	

The following values are currently stored. (The shipped value is shown first.)

- Positions 1 to 6: Standards Option *AS400, *DB2, *ISO.
- Positions 7 to 10: Naming Option *SQL, *SYS.
- Positions 11 to 14: Date Format *JOB, *ISO, *EUR, *JIS, *USA, *MDY, *DMY, *YMD, *JUL.
- Positions 15 to 21: Date Separator *JOB, *SLASH, *PERIOD, *COMMA, *DASH, *BLANK.
- Positions 11 to 14: Time Format *ISO, *EUR, *JIS, *USA, *HMS.
- Positions 26 to 32: Time Separator *JOB, *COLON, *PERIOD, *COMMA.
- Positions 33 to 39: Decimal Point *PERIOD, *COMMA.
- Positions 40 to 43: Generate aliases *YES, *NO. When generating aliases you can specify replacement characters XSQLCVRPL. The data area containing replacement characters are XSQLCVRFR and XSQLCVRTO.
- Positions 44 to 51: Leading numeric processing for aliases *PREFIXN, *XLATE. If *PREFIXN is specified then "N" is added to the beginning of the alias name. *XLATE will translate the numeric into characters. (NOT YET IMPLEMENTED.)
- Positions 52 to 55: Compress embedded blanks for aliases *YES, *NO. If *YES is specified then wherever there are two or more contiguous underscores in the generated alias they will be replaced by a single one.

#### Data Areas XSQLCVRFR and XSQLCVRTO

If you have requested the generation of aliases then you can specify replacement for invalid characters. You can specify up to 50 *from characters* in the **XSQLCVRFR** data area and up to 50 *to characters* in the **XSQLCVRTO** data area.

The characters are matched between *from* and *to* areas.



```
Display Data Area
                                                                      DBS525B
                                                            System:
                            XSQLCVRFR
Data area . . . . . .
                             XAN4CDXA
 Library .
            •
             . . . .
                        :
                            *CHAR
Туре
             . . . . . :
     . . .
            .
              . . . . . :
                            50
Length . .
            .
Text . . . .
              . . . . . :
                            XDDSTOSQL Replacement Characters, From
          Value
Offset
           *...+....1....+....2....+....3....+....4....+....5
   0
           '@#$.
```

	Display Data Area System: DBS525B	
Data ana		
Data area :	XSQLCVRTO	
Library :	XAN4CDXA	
Type :	*CHAR	
Length :	50	
Text	XDDSTOSQL Replacement Characters, To	
Value		
Offset *+1+	2+	
0 'QZX_	,	

If any of the following characters remain then they are automatically removed: ,.;:!?%<>/\+-=*&f]{}

Embedded blanks are then replaced with underscores.

The only values that may normally need changing relate to the generation of aliases.

#### **File Exclusions**

Files are excluded in three ways:

- Source PF files which have been loaded into X-Analysis are automatically excluded. These can be found in the **XPFSRC** file.
- Files with no members or multiple members are automatically excluded. A message is written to the error log for each of these files.
- Files can be manually excluded by adding them to the XMDLEXCS file. (The Reason Code should be set to blank.)

#### **Error Log**

An Error Log is written to source member ERRORLOG in QTXTSRC in the X-Analysis library. The messages may be diagnostic or terminal.

#### **Exception Processing**

Please note the following:

- Multi-format files: Indexes are created for each file access path.
- LFs not using the PF format name or where individual fields specified: The format name is retained.
- No statement is required to point to the original PF format name.
- JOIN Files: JFILE and JOIN point to the SQL table names. The format name is retained. No statement is required to point to the original PF format name.
- FIFO/LIFO Files: The keyword cannot be used with SQL tables and is removed. A message is written to the error log for each file.
- REFERENCE Fields: These can only be used in PFs so the references are removed. A message is written to the error log for each file.
- TEXT specified on an LF format: Where the PF format can be added, TEXT cannot be specified so it is removed.
- ALWNULL, CCSID() and DFT() field keywords: These are removed from the original PF definition when it is converted to an LF definition. (They will have been generated in the DDL source for the SQL table.)

### **Command Parameters**

The **XDDSTOSQL** command requires the following parameters:

- **X-Analysis Library:** Enter the name of the X-Analysis cross-reference library built for the application containing the database objects to be converted.
- **New Database Library:** Enter the name of a new library which will contain the converted database.
- Application Area: Enter the name of the application area containing the database objects to be converted. You can also enter the special value of *ALL. This will result in all database objects in the application being converted.
- Compilation Type: This option will allow the user to choose whether this command should run all compilation commands or whether calls should be made to external change control systems. When the *INLINE option is selected, the user will be able to set various compile command parameters using data areas.

# XWRKDTAARA command

The **XWRKDTAARA** command assists the user to maintain various values for data areas used in **XDDSTOSQL** command. The command is available in the library **XAOBJ**, which must be included in the library list, before executing the command. The command accepts the following two parameters:

# XWRKDTAARA XRFLIB(XAN4CDXA) SYSTEM(XDDSTOSQL)

XRFLIB - Cross-Reference library

**SYSTEM** – The name of the command for which related data areas have to be listed.

```
X-Analysis Work with Data Areas Databorough Ltd.

XARWKDARAS 12:50:53

2015-02-21

Enter options, press Enter.

5=Work with values

Data Area

XDDSTOSQL Source Flag

XDDSTOSQL Run Parameters

XDDSTOSQL Replacement Characters, From

XDDSTOSQL Replacement Characters, To

XDDSTOSQL SQL Table Name Suffix
```

The above screen displays the command screen for **XWRKDTAARA**. Data areas related to the **XDDSTOSQL** command are listed here. The user can use **Option=5** against any of them to view/modify their value.

# **GENERATE DATABASE SERVICE PROGRAMS**

The **Generate Database Service Programs** option calls the IBM i command, **XWRTDBSP** and submits the job in batch. This option is available on cross-reference library, application areas and physical files (PF).

Opt for the context menu on the tutorial application and select the **Generate Database Service Programs** option from the **Export Options** submenu. The following dialog invokes when the user selects the option:

🖨 Generate Database Service Progr 🔀			
X-Ref Library	XAN4CDXA		
Application Area	*ALL		
Template Source Member	ZUTEMPLATE		
	Cancel		

# **Generate Database Service Programs dialog**

Click **OK** to execute the batch command.

Opt for the context menu on the application area **ORDERS**, and select the **Generate Database Service Programs** option from the **Export Options** submenu. The following dialog invokes when the user selects this option:

# Generate Database Service Programs dialog for application area, ORDERS

🖨 Generate Database	Service Progr 🔀		
X-Ref Library	XAN4CDXA		
Application Area	ORDERS		
Template Source Member	2UTEMPLATE		
0	K Cancel		

The **XWRTDBSP** command will generate Service programs for the specified database files. The generated source will be placed in **QRPGLESRC** of the specified cross-reference library. The type of service program generated will depend on the template specified.

The command requires Template Source Member name as input parameters.

The pre-defined templates are located in **XAOBJ/QRPGLESRC**. The following are the available pre-defined templates:

- **ZUTEMPLATE** file update/delete program template
- **ZSTEMPLATE** this will generate an SQL CRUD service program.
- **ZXTEMPLATE** this will generate an SQL extended READ service program.
- **ZRTEMPLATE** this will generate an RPGLE CRUD service program.

### **Generated Service Program**

The service program naming depends upon the template selected. The following table explains this:

Template	Service Program starting with
ZUTEMPLATE	ZU
ZSTEMPLATE	ZS
ZRTEMPLATE	ZR
ZXTEMPLATE	ZX

On selecting **ZSTEMPLATE**, an SQL CRUD service program is generated; whereas on selecting **ZRTEMPLATE**, an RPGLE CRUD service program is generated. In both the cases, a service program is generated containing sub-procedure definitions for READ / UPDATE / WRITE / DELETE record.

On selecting **ZXTEMPLATE**, an SQL extended READ service program is generated. The generated service program contains sub-procedure definitions for Extended READ.



# **Using Generated Service Program**

The following is a snapshot of the generated service program:

```
Snapshot of a Database Service Program
```

```
H*1_____
H debug(*yes) copyright('Databorough Ltd. 2008')
H nomain
D*1Definitions
D zrecord e ds
                             extname (condet)
D zrecordsql e ds
                             extname(condet)
D
                            prefix(sql)
D zrecordcpy e ds
                             extname (condet)
D
                             prefix(cpy)
D*1Data structure containing all required parameters
D^{\star 1} Plus: before and after database record image.
D^{\star 1} Keys passed in ZOLDRECORD, data returned in ZNEWRECORD
D zsdata
             ds
D znewrecord
                             like(zrecord)
D zoldrecord
                             like(zrecordcpy)
D/copy qrpglesrc,zsheader
D*1Prototypes
D*1Read
                             likeds(zsdata)
D zcondetr
            pr
D zreadparms
                             likeds(zsdata)
D*1Update
D zcondetu
              pr
                             likeds(zsdata)
                             likeds(zsdata)
D zupdateparms
D*1Write
                             likeds(zsdata)
D zcondetw
              pr
D zwriteparms
                             likeds(zsdata)
D*1Delete
D zcondetd
                             likeds(zsdata)
              pr
D zdeleteparms
                             likeds(zsdata)
```

Note the various sub-procedures defined (for Read, Update, Write, and Delete) in the service program are displayed above.

The user should call the appropriate sub-procedure to READ / UPDATE / WRITE / DELETE the record. There is one parameter – a data structure which includes a 'before' and 'after' image of the database record, plus the fields in the copybook member **ZSHEADER**. Keys are passed in the 'before' image (ZOLDRECORD) and data is returned in the 'after' image (ZNEWRECORD).

Currently, only one field is used from ZSHEADER – ACTION.



# The copy-book member ZSHEADER

O*1SERVICE PROGRAM PARA	METERS		
D*1			
D inuser	10		
D indate	8		
D intime	6		
D action	10		
D entrypoint	20		
D rtnmsgtp	1		
D rtnmsg	80	dim(20)	
D rtnmsgids	7	dim(20)	
D rtnflds	30	dim(20)	
D rtnupdbuf	1		
D rtnnewfun	23		
D gtots	30p 9	9	
D zworkflds	50a	dim(20)	
D zwfnames	30a	dim(20)	
D zwftypes	1a	dim(20)	
D supflds	30	dim(20)	
D conflds	30	dim(20)	
D clrflds	30	dim(20)	
D ovrclrs	3	dim(20)	
D selact	20		
D supacts	23	dim(50)	
D calltype D*1	1		

# **Document Manager**

The Documenter (Document Manager) facilitates the generation of a PDF/MS Word document containing the system design information for the specified objects in an application.

The System Documentation is generated in the following two ways:

- Marking the individual objects/complete list
- Documenting an application area

# **MARKING THE INDIVIDUAL OBJECTS/COMPLETE LIST**

Follow the steps below to generate the system document:

- 1. Start X-Analysis.
- 2. Select a cross-reference from the cross-reference list view.
- 3. Mark objects to be included for the System Documentation process. To mark the objects for documentation process, use the context menu on objects and select the **Mark for Documenter** option. Alternatively, the entire list can be selected for documentation by selecting the **Mark all for Documenter** option, available under the X-Analysis menu.
- 4. Select the **Documenter** button from the main toolbar.

e	X-Analy	ysis - Document Man	ager	
	Name	Туре	Description	Move Up
	CON001 OE008	*PGM *PGM	Contract Entry Order Entry	
				Move Down
				Delete
				Delete All
				Invert Selection
		Generate Document	Save & Exit Cance	

**Document Manager** 

The Objects/Members on the documenter list can be arranged using the **Move Up / Move Down / Delete / Delete All** buttons on the Document Manager.

The Document Manager provides a facility for object selection for system document – **Invert Selection**. On clicking **Invert Selection**, the selected object gets un-selected and all other un-selected objects get selected.

After ordering of the objects, click **Generate Document**. This invokes the Documenter Wizard, as shown below:

🖶 X-Analysis	
System Documentation - Type and Location Select the type of documentation and its location	
System Documentation can generate: - Single document with documentation of all the objects marked for documentation, OR - Generate multiple documents for each object marked for documentation.	
<ul> <li>System Documentation type</li> <li>Generate Single System Document</li> <li>Generate Individual System Documents</li> <li>Generate System Documents using previous values</li> </ul>	
Document Details         Document Title       System Document for XAN4CDXA         Name:       System Document for XAN4CDXA.pdf         Path:       Brow         C:\Documents and Settings\alakh\My Documents\X-Analysis Application         Data\192.168.170.10\PCF_XAN4CDXA\System Document for XAN4CDXA.pdf	ISE
O < Back Next > Finish Can	rel

System Documenter Wizard

Note that the **Documenter** option can also be alternatively accessed from the **Export Options** drop-down on the Source Browser toolbar of a selected object.

# **Document Wizard Sections**

## System Documentation Type

Various options are available for the System Documentation type. By default, the **Generate Single System Document** option is checked.

#### **Document Details**

**Document Title** – The user can change document title as per the requirement.

Path – Click the Browsebutton to change the default path. The default path is<C:\Documents</td>andSettings\alakh\MyDocuments\X-AnalysisApplicationData\192.168.170.10\PCF_XAN4CDXA>

Press **Next** to proceed further. For Single System Documentation, the following dialog is displayed:



Generate Single System Document – Options			
<b>\$</b>	X-Analysi	is	- 🗆 🗙
System Documentatio	n - Specify Conter	nts	
Select features to be includ	ed in the System Docur	ment	=
✓ Object List			
Data Model Diagram	<u></u>		
	In Word as Image		
	🔵 In Visio		Annotation
LF/Access Path details			Detailed
File Field Details Object Where Used			Field Annotation
Data Flow Diagram			
Normal	Detailed		<ul> <li>Annotation</li> </ul>
Structure Chart			
Normal	Expanded	( D	etailed
	Depth	5 🗸 🗸	✓ Annotation
Screen Flow Diagram			
Normal	Expanded		
Program Structure Chart			Annotation
Screen/Report Layout			
Normal	<ul> <li>Detailed</li> </ul>		
Business Rules			
Summary	O Detailed		Export to MS Excel
			Include Internal Rtn's
Source	Source level	1 ~	Pseudo Code
Flowchart	Level	1 ~	
Business Process Logic	Level	4 ~	
?	Back Next >		Finish Cancel

A user can select different options from the above dialog as per the requirements. If a user selects the **Business Rules** for documentation, then he has the option to get the business rules documented in MS Excel. This can be done by checking the **Export to MS Excel** option. If the user selects the Business Rules for documentation with the **Summary** 

option, then the basic rule information will be documented; if the user selects the **Detailed** option, then the logic behind the rule will also be documented.

<b>a</b>	X-Analysi:	s		- <b>-</b> ×
System Documentati	on - Specify Conten	ts		
Select features to be inclu	ided in the System Docun	nent		
✓ Object List				
<ul> <li>Data Model Diagram</li> <li>Normal</li> </ul>	In Word as Image			
O Detailed	🔘 In Visio			Annotation
<ul> <li>LF/Access Path details</li> <li>File Field Details</li> <li>Object Where Used</li> </ul>				Detailed Field Annotation
<ul> <li>Data Flow Diagram</li> <li>Normal</li> </ul>	O Detailed			✓ Annotation
Structure Chart				
Normal	<ul> <li>Expanded</li> </ul>		D	etailed
	Depth	5	~	<ul> <li>Annotation</li> </ul>
<ul> <li>Screen Flow Diagram</li> <li>Normal</li> </ul>	◯ Expanded			
Program Structure Cha	rt			Annotation
<ul> <li>Screen/Report Layout</li> <li>Normal</li> </ul>	O Detailed			
✓ Business Rules				
Summary	O Detailed			Export to MS Excel
Source	Source level	1	~	Pseudo Code
✓ Flowchart	Level	1	~	
Business Process Logic	Level	4	~	
0	< Back Next >			Finish Cancel

If a user selects the **Screen/Report Layout** for documentation with the **Normal** option, then the System Documentation process will print the Screen and the Fields list of

individual formats one after the other, for all the screen formats. If the **Detailed** option is selected, then it will also print the Header information, the Data Content Diagram and the Screen Action Diagram for each screen, apart from the Screens and the Fields List for all the screen formats.

Select the options to be included in the document and click **Next** to proceed further.

Single System Document – Specify Seq	uencing
X-Analysis	- 🗆 🗙
System Documentation - Specify Sequence What sequence would you like to have for the System Document?	
Object List Data Model Diagram - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Screen/Report Layout - Normal Business Rules - Summary Source Source Flow Chart Business Process Logic Screen Flow Diagram - Normal	Move Up Move Down
? < Back Next > Finish	Cancel

# From the above screen, the user can re-sequence the options selected for the System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all the selections that he has made and can also define various options related to document formatting, like 'Paper Size', 'Contention Resolution', etc.



Single System Docu	ment – Finish
X-Analys	is – 🗆 🗙
System Documentation – Finish Define the Page Size and Contention Resolution (	Option
Selected Sequence Object List Data Model Diagram - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Screen/Report Layout - Normal Business Rules - Summary	Level Settings Structure Chart Level 5 Source Level 1 Source Flow Chart Level 1 Business Process Logic Level 4 Screen Flow Diagram Level -1
Source Source Flow Chart Business Process Logic Screen Flow Diagram - Normal	Paper Size O Letter (8.5" x 11") ( A4 Size (8.27" x 11.69")
Contention Resolution System Documentation creates documents in A Application Folder is shared, and documents are documentation is in progress, then this may lead Please select appropriate options to enable reso O Do not overwrite	created/opened while the d to contention.
Create document by similar name	Exit/Skip document creation
(?) < Back Next >	Finish Cancel

Click **Finish** to generate the document. The progress status is displayed on the screen while generating the System document. The document will be located in the specified save location.

# **Generate Individual System Documents**

Select the Generate Individual System Documents option from the following dialog:

Individual System Documents – Type and Location	
🖨 X-Analysis	
System Documentation - Type and Location Select the type of documentation and its location	
System Documentation can generate: - Single document with documentation of all the objects marked for documentation, - Generate multiple documents for each object marked for documentation.	OR
System Documentation type Generate Single System Document Generate Individual System Documents Generate System Documents using previous values	
Document Details         Document Title         Folder:         < Select Browse to set location >         Path:         < Select Browse to set location >	Browse
? < Back Next > Finish	Cancel

After selecting the **Generate Individual System Documents** option, click **Browse**. Select the desired location to save the document.



# **Document Folder**

Browse For Folder
<ul> <li>Desktop</li> <li>My Documents</li> <li>My Computer</li> <li>My Network Places</li> <li>My Network Places</li> <li>Online Help New Images</li> </ul>
Folder: My Documents
Make New Folder OK Cancel

For the **Generate Individual System Documents** option, the following dialog is displayed after the user clicks **Next** on the System Document Wizard:



Individual System Documents – Features						
😂 X-Analysis – 🗆 🗙						
System Documentation Select features to be include						
Object List						
Data Model Diagram Normal	la Word as Images					
<ul> <li>Detailed</li> </ul>	<ul> <li>In Word as Image</li> <li>In Visio</li> </ul>		Annotation			
LF/Access Path details			Detailed			
File Field Details			Field Annotation			
Object Where Used						
✓ Data Flow Diagram	0.0.1					
Normal	<ul> <li>Detailed</li> </ul>		<ul> <li>Annotation</li> </ul>			
<ul> <li>Structure Chart</li> <li>Normal</li> </ul>	◯ Expanded	ODe	etailed			
0	Depth	5 ¥	✓ Annotation			
Screen Flow Diagram						
<ul> <li>Normal</li> </ul>	Expanded					
Program Structure Chart	t		Annotation			
Screen/Report Layout						
Normal	Oetailed					
Business Rules			Export to MS Excel			
Summary	<ul> <li>Detailed</li> </ul>		Include Internal Rtn's			
Source	Source level	1 🗸	Pseudo Code			
✓ Flowchart	Level	1 🗸				
Business Process Logic	Level	4 ~				
?	< Back Next >		Finish Cancel			

The **Object List** option is disabled in this dialog. Choose the options which you want to document from the above dialog.

If a user selects the **Business Rules** for documentation, then he has the option to get the business rules documented in MS Excel. This can be done by checking the **Export to MS Excel** option. If the user selects the Business Rules for documentation with the **Summary** 

option, then the basic rule information will be documented; if he selects the **Detailed** option, then the logic behind the rule will also be documented.

If a user selects the **Screen/Report Layout** for documentation with the **Normal** option, then the System Documentation process will print the Screen and the Fields list of individual formats one after the other, for all the screen formats. If the **Detailed** option is selected, then it will also print the Header information, the Data Content Diagram and the Screen Action Diagram for each screen, apart from the Screens and the Fields List for all the screen formats.

Click **Next** which displays the following screen:

Individual System Documents – Specify Sequencing					
X-Analysis	- 🗆 🗙				
System Documentation - Specify Sequence What sequence would you like to have for the System Document?					
Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Source Source Flow Chart Program Structure Chart Screen Flow Diagram - Normal	Move Up Move Down				
? < Back Next > Finish	Cancel				

From the above screen, the user can re-sequence the options selected for System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all the selections that he has made and can also define

various options related to document formatting, like 'Paper Size', 'Contention Resolution', etc.

Individual System Documents – Finish					
🗢 X-Anal	ysis — 🗆 🗙				
System Documentation - Finish Define the Page Size and Contention Resolution (	Option				
Selected Sequence Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Source Source Flow Chart Program Structure Chart Screen Flow Diagram - Normal	Level Settings Structure Chart Level 5 Source Level 1 Source Flow Chart Level 1 Screen Flow Diagram Level -1				
	Paper Size O Letter (8.5" x 11") (  A4 Size (8.27" x 11.69")				
Contention Resolution System Documentation creates documents in A Application Folder is shared, and documents are documentation is in progress, then this may lead Please select appropriate options to enable reso O Do not overwrite	created/opened while the to contention.				
Create document by similar name	) Exit/Skip document creation				
? < Back Nex	t > Finish Cancel				

Click **Finish** to generate the document. The progress status is displayed on screen while generating the system document. The generated document will be available in the specified saved location.

# System Documents using previous values

X-Analysis provides a unique feature of recalling previous options opted by the user in the System Documentation process. With the help of this feature the user can generate a

System Document without selecting the same options again for the System Documentation process.

The **Generate System Documents using previous values** option can be used by the user when he wants to generate the System Document using the previous options selected for the System Documentation.

This option gets disabled if the user switched to generate the System Document for Application Area from System Documentation for Object(s) or vice-versa. Start the Documenter (either by marking individual Objects for Documentation or selecting the **Documenter** option on Application Area). Select the **Generate System Documents using previous values** option from the documentation wizard as shown below:

#### Generate System Documents using previous values – Type and Location

🖶 X-Analysis		
System Documer	tation - Type and Location	
Select the type of do	cumentation and its location	
System Documentatio	n can generate:	
	n documentation of all the objects marked for doc icuments for each object marked for documentati	
System Documentat	ion type	
O Generate Single	System Document	
O Generate Individ	ual System Documents	
Generate System	Documents using previous values	
Document Details		
Document Title		
Name:		
System Docum	ent for XAN4CDXA.pdf	
Path:		Browse
D:\Program File Document for :	es\Databorough\X-Analysis\192.168.170.10\PCF KAN4CDXA.pdf	_XAN4CDXA\System
0	< Back Next > Fit	nish Cancel

After selecting the **Generate System Documents using previous values** option, click **Browse** to invoke the **Save As** dialog. Select the desired location to save the document and enter a new file name, if required.



Save As						? 🔀
Save in:	C PCF_XAN4CD	XA	*	G 🦻 🖻	•	
My Recent Documents		nt for XAN4CDXA - Applicati nt for XAN4CDXA.pdf	on Area	MVCPROCESS.	pdf	
Desktop						
My Documents						
My Computer						
<b></b>	File name:	XAN4CDXA - Application A	rea MV	CPROCESS 🛩		Save
My Network	Save as type:	*.pdf		*		Cancel

Then, click Finish to initiate the System Documentation Process.

# **DOCUMENTING AN APPLICATION AREA**

The **Document Application Area** option documents all information about objects belonging to the selected application area. This option is available on the context menu of an application area and invokes the System Documentation Wizard.

On selecting the **Document Application Area** option, the following System Documentation Wizard appears:

Type and Location
👄 X-Analysis 📃 🗖 🔀
System Documentation - Type and Location
Select the type of documentation and its location
System Documentation can generate:
<ul> <li>Single document with documentation of all the objects marked for documentation, OR</li> <li>Generate multiple documents for each object marked for documentation.</li> </ul>
System Documentation type
O Generate Single System Document
O Generate Individual System Documents
Generate System Documents using previous values
Document Details
Document Title         System Document for XAN4CDXA - Application Area MVCPROCESS
Name:
System Document for XAN4CDXA - Application Area MVCPROCESS.pdf Path: Browse
C:\Documents and Settings\alakh\My Documents\X-Analysis Application Data\192.168.170.10\PCF_XAN4CDXA\System Document for XAN4CDXA - Application Area MVCPROCESS.pdf
(?) < Back Next > Finish Cancel

You can choose from the following options:

- 1. Generate a single document with documentation for all objects marked for documentation in the Application Area.
- 2. Generate individual documents for all object marked for documentation in the Application Area.
- 3. Generate System Document using previous values for the Application Area.

# **Document Application Area-Single System Document**

Select the Generate Single System Document option, as displayed below:

Single S	wstem	Document -	- Tvi	he and	Location	
Jingle J	yatem	Document		Je anu	LUCATION	

🖨 X-Analysis					
	tation - Type and Location cumentation and its location				
System Documentation can generate: - Single document with documentation of all the objects marked for documentation, OR - Generate multiple documents for each object marked for documentation.					
Generate System					
Path: C:\Documents a	System Document for XAN4CDXA - Application Area MVCPR ent for XAN4CDXA - Application Area MVCPROCESS.pdf and Settings\alakh\My Documents\X-Analysis Application 170.10\PCF_XAN4CDXA\System Document for XAN4CDXA - A CESS.pdf	Browse			
?	< Back Next > Finish	Cancel			

To change the default document name and path, click **Browse** to specify new document name and path. The default location is <Application Folder>.

After this step, click **Next** to proceed further as shown below:



Single System Document – Application Area Features				
🖨 X-Analysis				
System Documentation - Application Area Options Select Application Area features to be included in the System Document				
Diagram Options	Chart O Expanded	ODetailed		
Data Model Diagram				
⊙ Normal ○ Detailed	⊙ In PDF as Imag ○ In Visio	ge 🔄 Show All		
Application Area Dia	gram			
Annotation	notation			
Coverage of System Do		etical Order		
O Detailed Object Doct	umentation in Call Se			
0	< Back	Next > Finish	Cancel	

The **Overview Structure Chart** and the **Data Model Diagram** options mentioned in this dialog are only for the selected application area.

The wizard dialog displayed above has a section called **'Coverage of System Document**'. This section has three options; depending upon these three options, the System Document differs in its approach. Let us see how these three options work.

### **Detailed Object Documentation in Alphabetical Order**

If the **Detailed Object Documentation in Alphabetical Order** option is selected, then the object documentation proceeds in ascending alphabetical order of the name of objects in the application area. The following dialog is displayed in the wizard:



Name SKLNO CNTCMAINTD	*DTAARA *FILE	Last Skeleton Letter' Contacts Maintenance	Delete Objects
CONDET CONDETL1	*FILE *FILE	Contract Detail 📃 🗐	Delete by Type
CONDETL2 CONDETL3	*FILE *FILE *FILE	by Store/Contract/Product/Contract	Select by Type
CONHDR	*FILE	Contract Header	
CONHDRL1	*FILE	by Debtor/Contract	
CONHDRL1A	*FILE	by Debtor/Cust Ref	
CONHDRL2	*FILE	by Rep/Contract	Undo All Deletes
CONHDRL3	*FILE	by Debtor/Date	
CONHDRL4	*FILE	by Debtor/Date/Rep	
CONHDRL5	*FILE	by Date	
CUSF	*FILE	Sites	
CUSFL1	*FILE	Sites by Name	
CUSFL2	*FILE	Sites by Status	
CUSFL3	*FILE	Sites by Number	
CUSFL5	*FILE	Sites by Dist.& Status	
CUSFL6	*FILE	Sites By Dist.& Name	
CUSFL7	*FILE	Sites by Last Cnt.Date	
CUSFL8	*FILE	Sites by Next Cnt.Date	
CUSFL9	*FILE	Sites by Fax No.	
CUSFLA	*FILE	Sites by Product - renan	
	* ETI E	Sites by Orig List	

The dialog offers removal of objects from the system documentation process, based on the name/type of objects. The selected name/type can be removed using the **Delete** buttons.



Single System Document – Document Features						
🚔 X-Analysis – 🗆 🗙						
System Documentation Select features to be inclu						
<ul> <li>Object List</li> <li>Data Model Diagram         <ul> <li>Normal</li> <li>Detailed</li> </ul> </li> <li>IF/Access Path details</li> <li>File Field Details</li> <li>File Field Details</li> <li>Object Where Used</li> <li>Data Flow Diagram         <ul> <li>Normal</li> <li>Structure Chart</li> <li>Normal</li> </ul> </li> </ul>	In Word as Image     In Visio     Detailed     Expanded		Annotation Detailed Field Annotation			
<ul> <li>Normal</li> <li>Screen Flow Diagram</li> </ul>	O Expanded Depth	5 v	Annotation			
Normal	◯ Expanded					
Program Structure Char	t		Annotation			
<ul> <li>Screen/Report Layout</li> <li>Normal</li> </ul>	◯ Detailed					
<ul> <li>Business Rules</li> <li>Summary</li> </ul>	○ Detailed		Export to MS Excel			
Source	Source level	1 ⊻	Pseudo Code			
✓ Flowchart	Level	1 ⊻				
✓ Business Process Logic	Level	4 ¥				
0	< Back Next >		Finish Cancel			

Choose the options which you want to document from the above dialog.

Click **Next** which will display the following screen:



Single System Document – Specify Sequence		
System Documentation - Specify Sequence	ce 📄	
What sequence would you like to have for the System	n Document?	
Application Area OSC - Normal	Move Up	
Application Area DMD - Normal	wove op	
Object List Data Model Diagram - Normal		
LF/Access Path details	Move Down	
File Field Details		
Object Where Used		
Data Flow Diagram - Normal with Annotation		
Structure Chart - Normal with Annotation		
Screen/Report Layout - Normal Business Rules - Summary		
Source		
Source Flow Chart		
Program Structure Chart		
Business Process Logic		
Screen Flow Diagram - Normal		
(?) < Back Next > Fir	nish <b>Cancel</b>	

From the above screen, the user can re-sequence the options selected for System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all selections that he has made and can also define various options related to document formatting like 'Paper Size', 'Contention Resolution', etc.



Select	Paper	Size	and	Resolution	

Define the Page Size and Contention	sh n Resolution Option			
Selected Sequence Application Area OSC - Normal Application Area DMD - Normal Object List Data Model Diagram - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Anno Structure Chart - Normal with Anno Screen/Report Layout - Normal Business Rules - Summary Source Source Flow Chart				
Contention Resolution System Documentation creates documents in Application Folder. If the Application Folder is shared, and documents are created/opened while the documentation is in progress, then this may lead to contention. Please select appropriate options to enable resolution: O Do not overwrite if exists, but if				
	to enable resolution:	use the		
	Overwrite if exists, but if in	use the		

Click **Finish** to generate the document.

**Detailed Object Documentation in Call Sequence Order** 

If the **Detailed Object Documentation in Call Sequence Order** option is selected, then the object documentation is based on the Overview Structure Chart for the selected application area. For this option, the Overview Structure Chart is always generated.

Detailed Object Documentation in a Call Sequence Order				
🖨 X-Analysis				
System Documentation - Application Area Options OSC will always be prepared for Call Sequence Order				
Diagram Options         Overview Structure Chart         Normal       Expanded         Data Model Diagram         Normal       In PDF as Image         Detailed       In Visio         Detailed       In Visio         Application Area Diagram         Annotation         Application Area Annotation         Coverage of System Document         Detailed Object Documentation in Alphabetical Order         Detailed Object Documentation         No Detailed Object Documentation				
? < Back Next > Finish C	Cancel			

Click Next to proceed further.



Detailed Object Documentation – Document Features				
😂 X-Analysis – 🗆 🗙				
System Documentation - Specify Contents Select features to be included in the System Document				
<ul> <li>Object List</li> <li>Data Model Diagram         <ul> <li>Normal</li> <li>Detailed</li> </ul> </li> <li>✓ LF/Access Path details</li> <li>✓ File Field Details</li> <li>✓ Object Where Used</li> <li>✓ Data Flow Diagram         <ul> <li>Normal</li> <li>✓ Structure Chart</li> <li>✓ Normal</li> </ul> </li> </ul>	<ul> <li>In Word as Image</li> <li>In Visio</li> <li>Detailed</li> <li>Expanded</li> </ul>		Annotation Detailed Field Annotation Annotation	
	Depth	5 🗸	<ul> <li>Annotation</li> </ul>	
<ul> <li>Screen Flow Diagram</li> <li>Normal</li> <li>Program Structure Cha</li> </ul>	◯ Expanded rt		Annotation	
Screen/Report Layout	Detailed			
Business Rules Summary	O Detailed		Export to MS Excel	
Source	Source level	1 🗸	Pseudo Code	
Flowchart	Level	1 ~		
Business Process Logic	Level	4 ~		
0	< Back Next >		Finish Cancel	

Choose the options which you want to document from the above dialog.

Click Next to proceed further.



Detailed Object Documentation – Specify Sequence				
X-Analysis	- <b>-</b> ×			
System Documentation – Finish Define the Page Size and Contention Resolution (	Option			
Selected Sequence Application Area OSC - Normal Application Area DMD - Normal Object List Data Model Diagram - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Program Structure Chart Screen Flow Diagram - Normal	Level Settings Application Area OSC Level 8 Structure Chart Level 5 Screen Flow Diagram Level -1 Paper Size O Letter (8.5" x 11") O A4 Size (8.27" x 11.69")			
Contention Resolution System Documentation creates documents in Application Folder. If the Application Folder is shared, and documents are created/opened while the documentation is in progress, then this may lead to contention. Please select appropriate options to enable resolution: O Do not overwrite Overwrite if exists, but if in use then				
• Create document by similar name O Exit/Skip document creation				
? Kext > Next >	Finish Cancel			

From the above screen, the user can re-sequence the options selected for System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all selections that he has made and can also define various options related to document formatting like 'Paper Size', 'Contention Resolution', etc.

#### Select Paper Size and Resolution

🖨 X-Analysis				
System Documentation - Finish				
Define the Page Size and Contention Resolution Option				
Selected Sequence Application Area OSC - Normal Application Area DMD - Normal Object List Data Model Diagram - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Source Source Flow Chart Program Structure Chart	Level Settings Application Area OSC Level 8 Structure Chart Level 8 Source Level 1 Source Flow Chart Level 1 Paper Size O Letter (8.5" × 11") A4 Size (8.27" × 11.69")			
Contention Resolution System Documentation creates documents in Application Folder. If the Application Folder is shared, and documents are created/opened while the documentation is in progress, then this may lead to contention. Please select appropriate options to enable resolution: O Do not overwrite O Overwrite if exists, but if in use				
Create document by similar name     CExit/Skip document creation				
? < Back Next	:> Finish Cancel			

Click **Finish** to generate the document.

# No Detailed Object Documentation

If the **No Detailed Object Documentation** option is selected, then only the Overview Structure Chart and/or the Data Model Diagram as specified in the **Application Area Options** dialog is created.



## No Detailed Object Documentation

🖨 X-Analysis			
System Documenta Select Application Area f		on Area Options ed in the System Document	
Diagram Options	Chart Chart	Opetailed	
Data Model Diagram     O Normal     O Detailed		ge	
Application Area Dia			
Annotation Application Area An	notation		
Coverage of System Do Detailed Object Doc Detailed Object Doc No Detailed Object I	umentation in Alpha umentation in Call Se		
0	< Back	Next > Finish	Cancel

Click Next to proceed further.



Sequencing of the Application Area Features				
🖨 X-Analysis	(			
System Documentation - Specify Sequence What sequence would you like to have for the System Docu	Iment?			
Application Area OSC - Normal Application Area DMD - Normal	Move Up Move Down			
? < Back Next >	Finish	Cancel		

From the above screen, the user can re-sequence the options selected for System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all selections that he has made and can also define various options related to document formatting like 'Paper Size', 'Contention Resolution', etc.

# TRESCHE

#### Select Paper Size and Resolution

🖶 X-Analysis				
System Documentation - Finish Define the Page Size and Contention Resolution Option				
Selected Sequence Application Area OSC - Normal Application Area DMD - Normal	Level Settings Application Area OSC Level 2			
	Paper Size • Letter (8.5" × 11") • A4 Size (8.27" × 11.69")			
Contention Resolution         System Documentation creates documents in Application Folder. If the Application Folder is shared, and documents are created/opened while the documentation is in progress, then this may lead to contention.         Please select appropriate options to enable resolution:         O not overwrite				
⊙ Create document by similar name ○ Exit	/Skip document creation			
? < Back Next	> Finish Cancel			

Click **Finish** to generate the document.

## **Document Application Area – Individual System Documents**

Select the Generate Individual System Documents option, as displayed below:

Document Application Area – Individual System Documents
🚔 X-Analysis
System Documentation - Type and Location Select the type of documentation and its location
System Documentation can generate: - Single document with documentation of all the objects marked for documentation, OR - Generate multiple documents for each object marked for documentation.
System Documentation type         O Generate Single System Document         O Generate Individual System Documents         O Generate System Documents using previous values
Document Details         Document Title         Folder:         < Select Browse to set location >         Path:       Browse         < Select Browse to set location >
? < Back Next > Finish Cancel

Click **Browse** to select the desired location to save the document and enter a new filename, if required.



Document Folder	
Browse For Folder	?×
<ul> <li>i Desktop</li> <li>i i Desktop</li> <li>i i Documents</li> <li>i i i My Documents</li> <li>i i i My Computer</li> <li>i i i My Network Places</li> </ul>	
Folder: My Documents Make New Folder OK Cano	el

After selecting the desired location for documentation and providing the file name, the System Documentation wizard processes further, as shown below:

#### **Select Application Area Features**

🖨 X-Analysis			
System Documenta Select Application Area	••	n Area Options I in the System Document	
	Expanded      Expanded      In PDF as Image     In Visio      agram      notation      coument cumentation in Alphabe cumentation in Call Seq	Show All	
?	< Back	Next > Fini:	sh Cancel

The **Overview Structure Chart** and the **Data Model Diagram** options mentioned in the above dialog box are only for the selected application area.

The wizard dialog displayed above has a section called **'Coverage of System Document**'. This section has two options, depending on which the System Document differs in its approach. Let us see how these two options work.

#### **Detailed Object Documentation in Alphabetical Order**

If the **Detailed Object Documentation in Alphabetical Order** is selected, then the object documentation generates in ascending alphabetical order of Object name from the application area. The following dialog is displayed in the wizard:

	Ex	clude Object List	
🖨 X-Analysis			
System Document Exclude objects from d		•	
Name SKLNO CNTCMAINTD CONDETL CONDETL2 CONDETL3 CONHDR CONHDRL1 CONHDRL1 CONHDRL3 CONHDRL3 CONHDRL3 CONHDRL4 CONHDRL5 CUSF CUSFL1 CUSFL2 CUSFL3 CUSFL3 CUSFL3 CUSFL5 CUSFL6 CUSFL6 CUSFL7 CUSFL8 CUSFL8 CUSFL9 CUSFL8 CUSFL9 CUSFL8 CUSFL8 CUSFL8 CUSFL9 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL9 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSFL8 CUSF	Type         *DTAARA         *FILE         *FILE	Description	Delete Objects Delete by Type Select by Type Undo All Deletes
0	< B	ack Next > Fin	ish Cancel

The dialog offers removal of objects from system documentation, based on name/type of objects. The selected name/type can be removed using the **Delete** buttons. Click **Next** to proceed further.



Features to Document				
<b>\$</b>	X-Analysi	is	- <b>-</b> ×	
System Documentation - Specify Contents Select features to be included in the System Document				
<ul> <li>Object List</li> <li>Data Model Diagram         <ul> <li>Normal</li> <li>Detailed</li> </ul> </li> <li>✓ LF/Access Path details</li> <li>✓ File Field Details</li> <li>✓ Object Where Used</li> <li>✓ Data Flow Diagram         <ul> <li>Normal</li> <li>✓ Structure Chart</li> <li>✓ Normal</li> </ul> </li> </ul>	<ul> <li>In Word as Image</li> <li>In Visio</li> <li>Detailed</li> <li>Expanded</li> </ul>		Annotation Detailed Field Annotation	
<ul> <li>Screen Flow Diagram</li> <li>Normal</li> <li>Program Structure Cha</li> </ul>	Depth O Expanded	5 🗸	Annotation	
<ul> <li>Frogram structure end</li> <li>Screen/Report Layout</li> <li>Normal</li> <li>Business Rules</li> <li>Summary</li> </ul>	O Detailed		Export to MS Excel	
<ul> <li>✓ Source</li> <li>✓ Flowchart</li> </ul>	Source level	1 ¥	Pseudo Code	
Business Process Logic	Level	4 ~		
0	< Back Next >		Finish Cancel	

Choose the options which you want to document from the above dialog.

Click **Next** which will present the following screen:

LEGACY

#### **Sequencing of the Features**

X-Analysis	- • ×
System Documentation - Specify Se	quence
What sequence would you like to have for the Document?	e System
Application Area OSC - Normal Application Area DMD - Normal LF/Access Path details File Field Details Object Where Used Data Flow Diagram - Normal with Annotation Structure Chart - Normal with Annotation Screen/Report Layout - Normal Source Source Flow Chart Screen Flow Diagram - Normal	
? < Back Next >	Finish Cancel

From the above screen, the user can re-sequence the options selected for System Documentation.

After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all selections that he has made and can also define various options related to document formatting like 'Paper Size', 'Contention Resolution', etc.

# LEGACY

#### Select Paper Size and Resolution

🖨 X-Analysis	
System Documentation - Finish	
Define the Page Size and Contention Resolution Option	
	while the documentation is in
Rex Nex	E> Finish Cancel

Click **Finish** to generate the document.

#### No Detailed Object Documentation

If the **No Detailed Object Documentation** option is selected, then only the Overview Structure Chart and/or the Data Model Diagram as specified in the **Application Area Options** dialog is created.



🖨 X-Analysis	
System Documentation - Application Area Options Select Application Area features to be included in the System Document	
Diagram Options V Overview Structure Chart Normal O Expanded O Detailed	
Data Model Diagram     Onrmal     Onetailed     In PDF as Image     Detailed     In Visio     Show All	
Application Area Diagram	
Annotation Application Area Annotation	
Coverage of System Document O Detailed Object Documentation in Alphabetical Order O Detailed Object Documentation in Call Sequence Order O Detailed Object Documentation	
O < Back Next > Finish	Cancel

Click Next to proceed further.



No Detailed Object Documentation -	- Specify Sequence
🖨 X-Analysis	
System Documentation - Specify Sequence What sequence would you like to have for the System Docu	ument?
Application Area OSC - Normal Application Area DMD - Normal	Move Up Move Down
? < Back Next >	Finish Cancel

From the above screen, the user can re-sequence the options selected for System Documentation. After re-sequencing, click **Next** to reach the final step of documentation wizard. Here, the user can see all the selections that he has made and can also define various options related to document formatting like 'Paper Size', 'Contention Resolution', etc.



No Detailed Object Docur	nentation – Finish
🖶 X-Analysis	
System Documentation - Finish	
Define the Page Size and Contention Resolution Opti	on
Selected Sequence	Level Settings
Application Area OSC - Normal Application Area DMD - Normal	Application Area OSC Level 2
	Paper Size
	⊙ Letter (8.5" × 11")
	O A4 Size (8.27" x 11.69")
Contention Resolution System Documentation creates documents in Applic Folder is shared, and documents are created/opene progress, then this may lead to contention. Please select appropriate options to enable resolut	ed while the documentation is in
• Create document by similar name	Exit/Skip document creation
(?) <b>Control and the second second</b>	ext > Finish Cancel

Click **Finish** to generate the document.

## System Document using previous values

We have already discussed this topic under the **Marking the individual objects/complete list** section.

# **DOCUMENTING AN ENTIRE APPLICATION**

The Document Entire Application option documents all information about objects belonging to the selected application. This option is available on the context menu of an application and invokes the System Documentation Wizard. The procedure for documenting an entire application is same as the procedure of documenting an application area.

# **DOCUMENT CHANGED OBJECTS**

The Document Changed Objects option documents those objects which have changed since the last initialisation was run on the cross-reference library. This option is available on the context menu on a cross-reference library.

The Document Changed Objects provides a filter criterion for the System Documentation process. The user can select the object's library, name, type and attribute, as per the requirement.

🖨 Filter Documentatio	n List			
Object				
	Library			
	*ALLUSR 💊	•		
Name	Туре	Attribute		
*ALL	*ALL			
	OK Cancel			

# **Filter Documentation List**

# VIEWING THE GENERATED DOCUMENT

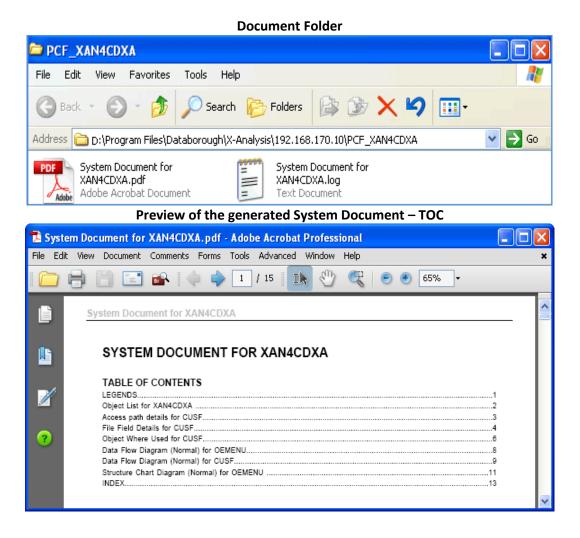
The default Application Folder for a specific application can be opened by selecting the Open Application Folder option from the X-Analysis menu from menu bar.



#### **Open Application Folder**

X-A	nalysis	Run	Window	Help
	New D	B400 C	Connection	
	New D	B2 Co	nnection	
	Mark a	ll for D	ocumenter)	r
	Change Application Folder			
	Open Log Folder			
	Open Application Folder			
	Authorize Google Drive			
	Report an Issue			
	Install SSL CA certificate			

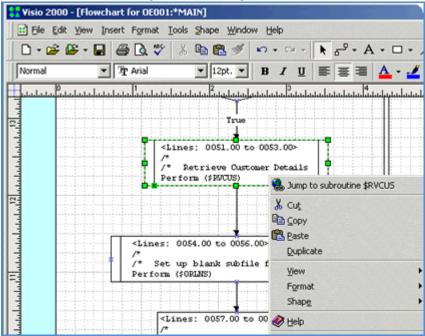
Locate the document in the specified save location and double-click on it to open the document.





Preview of the generated System Document – Legend				
🔁 System Document for XAN4CDXA.pdf - J	Adobe Acrobat Professional			
File Edit View Document Comments Forms T	fools Advanced Window Help	×		
	2 / 15 🚺 🖑 🥰 💿 🖲 64.9% 🗸			
System Document for XAN4CDXA	A.	~		
		_		
Structure Chart Diagram Legends				
Update				
Display				
Print				
Input				
Output				
Command				
Cothers				
Indeterminate				
Trigger				
Data Flow Diagram Legends				
Update				
Display				
Print				
Input				
Output				
Called Program				
Calling Program Access Path				
Command Indeterminate				
Trigger				
ingger				
Data Model Diagram Legends				
Accesses		~		

If the **Flowchart** option is selected, then the flowchart will be generated using Microsoft Visio, and its link is placed in the System Document.



#### Flowchart generated using Microsoft Visio

# LIMITATIONS OF X-ANALYSIS SYSTEM DOCUMENTER

#### **Editing another Word Document**

X-Analysis uses OLE Automation to send data to Microsoft Word. This depends on Automation objects provided by Microsoft Word. Automation objects by Microsoft Word have the limitation that when Automation is used on a Word document, then, editing of another Word document may get affected or may interfere with the automation process of the system document.

The following problems may be noticed in the document being edited:

- The cursor will frequently change to hourglass.
- Text once selected may not be unselected.
- After clicking a menu it may disappear by itself.
- Opening a dialog may end/block the documentation process abruptly.

## **USING THE ANNOTATOR**

#### Annotate option

The **Annotate** option is available on the context menu of an object or field name. Selecting the **Annotate** option invokes a dialog box. Provide the required text and click **Save**. The annotation is stored in a table available in the cross-reference library.

_	Annotation dialog for a program object			
6	Annotation for CUSTMNT1	X		
1	Additional Notes			
İ		~		
l		<u>×</u>		
	Save Delete Cance	*		



## **Object type-based Annotation**

The annotations based on the Object type are saved in a table available in the cross-reference library.

Select the **All Objects** option from the navigation pane, and opt for the context menu. Then, select the **Annotation Template** option. This invokes a dialog box as shown here:

			Annotatio	n Template			
e	Annotation	Template					X
	Object Type	*CMD	2	/			
	Headings					Sequence	
							-
							_
							-
							_
							-
			Add	Delete	Save	Cancel	]

From the **Object Type** drop-down, select the required object type. After that, provide appropriate headings for the object type and click **Save**. When you now annotate the specified object type you can see the prescribed heading.

# **Appendix A – X-Analysis Offline**

The X-Analysis Client can also be used to run in offline mode. The offline mode of X-Analysis is based on the IBM DB2 database. X-Analysis offline can be used in the following scenario:

Analysis of PC-based application (which uses the IBM i) – Java, VB, VB.Net and PowerBuilder, by using XA-Open of Fresche Legacy. For details on XA-Open, refer to the XA-Open User Manual.

# X-ANALYSIS OFFLINE PREREQUISITES

Ensure that your environment meets the following requirements:

- IBM DB2 Express-C must be installed.
- Set X-Analysis Preferences
  - Before connecting the offline X-Analysis, you need to specify the DB2 port number in the X-Analysis Preferences settings (in case different from the default port number 50000).
- XAN4CDXA Configurator can be optionally run to setup the demo application XAN4CDXA



X-Analysis Preferences			
•	Preferences – 🗆 🗙		
type filter text	X-Analysis 🗘 🗢 🗸 🗸		
General Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis XDoclet XML	General X-Analysis Preferences.         IP Address       192.168.170.10         User		
0	OK Cancel		

# **START X-ANALYSIS OFFLINE**

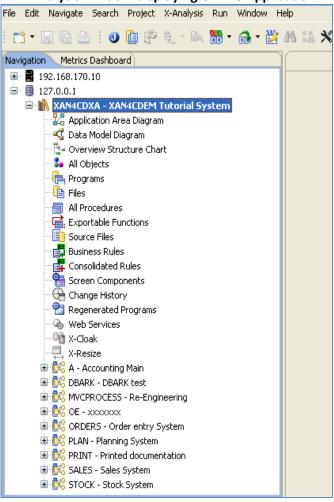
Select the **New DB2 Connection** option and provide the required details in the dialog box, as shown below:

č	5
	1

#### X-Analysis Sign-on dialog

٢	Sign-on to X-Analysis 🍡 🎴		
-	Host Name Username	192.168.170.10 MARK	]
<u></u>	Password ••••••		]
Login Cancel			

Then, click **Login** to start offline session of X-Analysis. On successful logon, the tutorial application **XAN4CDXA** can be seen located under the navigation view (displayed below):



#### X-Analysis window displaying Offline Application

# **Appendix B – Enabling the SEU Interface**

# CREATE USER PROFILE XAN4SEU

When browsing source code using the IBM i (**AS400**) **SEU**, it is necessary to be logged in as user **XAN4SEU**. The following gives instructions for creating the correct user profile.

Step 1 Logon as QSECOFR.

Step 2 Create XAN4SEU user profile.

Use the **CRTUSRPRF** command to create the **XAN4SEU** user profile. Make sure that the following parameters are set:

User Password	:	XAN4SEU
User Class	:	*PGMR
Initial Program	:	XSEUCLP
Library	:	XAOBJ

Create User Profile (CRTUSRPRF)

Press F10 and Page Down



Set Special Authorities:



*JOBCTL

*SAVSYS

Change User Pr	cofile (CHGUS	RPRF)
Type choices, press Enter.		
Additic	onal Paramete	rs
Special authority	*ALLOBJ *JOBCTL *SAVSYS	*SAME, *USRCLS, *NONE
Special environment Display sign-on information Password expiration interval Limit device sessions Keyboard buffering Maximum allowed storage Highest schedule priority Job description Library	*SYSVAL *SYSVAL *SYSVAL *SYSVAL *NOMAX 3 QDFTJOBD QGPL *NONE	0-9 Name
F3=Exit F4=Prompt F5=Refresh F24=More keys	F12=Cancel	More F13=How to use this display

Step 3 Logoff.

# **CREATING MACRO OF XAN4SEU**

Macros allow you to automatically sign on for XAN4SEU, and seamlessly work with the **SEU** option. So, it is necessary to verify whether the XAN4SEU macro has been created. If not, then record this macro using the following steps:

Step 1: Press the **Start Recording** button. The **Record Macro/Script as** dialog will be displayed. Sign on with the **XAN4SEU** user profile.



File Name:	Directories: OK
XAN4SEU	c:\\emulator\private
.102 Machine.mac	Record Format Cancel
log.mac LOGIN.mac	C VBScript File Help
login1.mac	Macro File
Description:	Record User Wait Time
	Actual
	C None
ist Files of Type:	C Fixed
Macro/Script Files [*.mac]	
	Express Logon for Macro
	Enable Application ID:

Step 2: On the Sign On screen, enter the User Profile – **XAN4SEU**. Press **Tab** and enter the Password also as **XAN4SEU**.

9] Session A - [24 x 80]			_ @ <mark>X</mark>
File Edit View Communication Actions Window Help			
	Sign On		
		System : DBSP	W7
		Subsy <mark>stem : QBAS</mark>	E
		Displ <mark>ay : QPAD</mark>	EV0014
	ser		
	assword		
	rogram/procedure		
	enu		
cu	Irrent library		
			0
	(C)		9.
M <u>A</u> a M₩		06/053	
데 1902 - Session successfully started			

Press ENTER. The IBM i main menu screen will be displayed:



<b>ni</b>	
Session A - [24 )	J and a constant of the consta
	IAIN IBM i Main Menu
	System: DBSPW7
	Select one of the following:
	1. User tasks
	1. USER TASKS 2. Office tasks
	3. General system tasks
	4. Files, libraries, and folders
	5. Programming
	6. Communications
	7. Define or change the system
	8. Problem handling
	9. Display a menu
	10. Information Assistant options
	1 <mark>1. IBM i Access tasks</mark>
	90. Sign off
	Selection or command
	3=Exit F4=Prompt F9=Retrieve F12=Cancel F13=Information Assistant
	23=Set initial menu
	C) COPYRIGHT IBM CORP. 1980, 2009.
MA a	
1902 - Session succe	

**Step 3**: Stop the recording by selecting the **Stop Recording Macro** option from the **Actions** submenu or clicking the related button directly from the toolbar.

D Session A - [24	(80]				. 7 🛛
File Edit View Corr	munication Actions Window Help				
🖻 🖻 🏝 🌌	Send File To Host	٠			
	Receive File From Host MAII Import/Export		Main Menu		
	Launch		nam nenu	System:	DBSPW7
	Sol	ollowing:		oga tem.	0001 #1
	Display Popup Keypad				
	Keyboard/Macro/Script Function				
	Stop Recording Macro				
	Cancel Recording Macro Pause Recording Macro	tem tasks			
		aries, and folders			
	5. Programming				
	6. Communicati				
	7. Define or c	hange the system			
	8. Problem han	dling			
	9. Display a m				
		Assistant options			
	11. IBM i Acces	s tasks			
	90. Sign off				
	Selection or comman				
	===>				
	E2-Euit E4-Decent	E0-Detrieue E	12-0-0-0-1	E12-Information Casi	at an t
	F3=Exit F4=Prompt F23=Set initial men		Iz-cancel	F13=Information Assis	stallt
	(C) COPYRIGHT IBM C				
		John 1900, 2009.			
м <u>А</u> а	MW		R	20/007	

Stop keystroke recording and save

# **Appendix C – Component Documenter**

The Component Documenter option documents the extracted Screen Components (Reengineered Functions). The option is available on the toolbar of Screen Components, Data Content Diagram, and Screen Action Diagram. The System document is generated for the selected Screen Component.

# **WORK WITH COMPONENT DOCUMENTER**

Expand the X-Analysis application library (cross-reference library), and then double-click the Screen Components node. This invokes the Screen Components list. Select the screen component for which component documentation is to be done, and then click the Component Documenter icon as shown below:

Component Documenter option on the Screen Components list						
闘 Business Rules 🕯	沿 Screen Componer	nts 🛛		🛛 🎪 🔣 🍕 ।	ê 🔍 🕃 🕶	‱ ♬  ⊜ ⊜ ▼ ⁻ □
Screen Components I	Screen Components for Application Library XAN4CDXA (All)					
Program	Function	Туре	Seq No	DSPF Format	Physical File	Title Component Documenter
	- CON00101G	Т	1	OESFL	CONDET	CONTRACT ENTRY
CUSFMAINT		I				
	CUSFMAINT01D	R	1	ZZFT01	CUSE	Customer Site Mainte
CUSFMOLD		I				
	CUSFMOLD01D	R	1	ZZFT01	CUSF	Customer Site Mainte
CUSFSEL		I				
	CUSFSEL01D	R	1	ZZCTL		Please select:
	- CUSFSEL01G	Т	1	ZZSFL	CUSE	Please select:
CUSFSELR		I				
	CUSFSELR01D	R	1	ZZCTL		Please select:
CUSGRSEL		I				
	CUSGRSEL01D	R	1	ZZCTL		Please select:
	- CUSGRSEL01G	Т	1	ZZSFL	CUSGRP	Please select:
CUSTMNT1		I				
	CUSTMNT101D	R	1	ZZFT01	DISTS	Customer Detail Main
	CUSTMNT102D	R	2	ZZFT02	CUSE	Customer Detail Main 👽
<		Ш			]	>

#### nent Documenter option on the Screen Components list

#### Note: Multiple selections of Screen Components are allowed for Component Documentation.

Click the Component Documenter icon to display the System Documenter Wizard, as shown below:



#### **Component Documentation – Wizard Screen-I**

🖶 X-Analysis		
-	ntation - Type and Location locumentation and its location	
	ion can generate: ith documentation of all the objects marked for documentation, documents for each object marked for documentation.	OR
O Generate Indiv	ation type e System Document idual System Documents em Documents using previous values	
Document Details		
Path: D:\Program F	System Document for XAN4CDXA ment for XAN4CDXA.pdf iles\Databorough\X-Analysis\192.168.170.10\PCF_XAN4CDXA XAN4CDXA.pdf	Browse
0	< <u>B</u> ack <u>N</u> ext > <u>Finish</u>	Cancel

#### **Document Wizard Sections**

#### System Documentation type

The following options are available for System Documentation type:

- Generate Single System Document This is the default option. It means that a single system document will be generated for all the selected objects.
- Generate Individual System Documents It means that individual system documents will be generated for all the selected objects.
- Generate System Documents using previous values X-Analysis provides a unique feature of recalling the previous options selected by the user in System Documentation process. Through the Generate System Documents using previous

**values** option the user is able to generate a System Document without choosing the same options again in System Documentation process.

#### **Document Details**

Document Title – The user can change document title as per the requirement.

Path – Click the **Browse** button to change the default path.

After making appropriate selections, click **Next** which displays the following screen:

🖨 X-Analysis	
System Documentation - Components Docume Select features to be included in the Components Document	nter
Header Information This includes Parameters and Windows information, if any.	Annotation
☑ Data Content	
Screen Actions	
Screen Design   Normal	◯ Detailed
Residual Logic Level 4	
Business Rules	
⊙ Summary O Detailed	Export to MS Excel
O < Back Next > Finite	sh Cancel

**Component Documentation – Wizard Screen-II** 

The user can select various options as per requirement from the Wizard Screen-II. The options available are:

- Header Information This prints the function header information from the screen design. It also prints the parameters and windows information for the selected screen component.
- Data Content This prints the data content diagram for the selected screen component.

- Screen Actions This prints the screen action diagram for the selected screen component.
- Screen Design (Re-engineered Screen) This prints the screen design (re-engineered screen) for the selected screen component. It has got two sub-options, Normal and Detailed. The default option is Normal. When the Detailed option is selected then the Field Details for the associated screen formats are also printed.
- Residual Logic This prints the business process logic for the re-engineered screen.
- Business Rules This prints the business rules for the selected screen.

After making the appropriate selections, click **Next** which displays the following screen:

🖨 X-Analysis	
System Documentation - Specify Sequence What sequence would you like to have for the System Document?	
Screen Components Header Information Data Content Screen Actions Screen Design Residual Logic Business Rules - Summary	Move Up Move Down
O < Back Next > Finish	Cancel

#### Component Documentation – Wizard Screen-III

Click **Next** which displays the following screen:

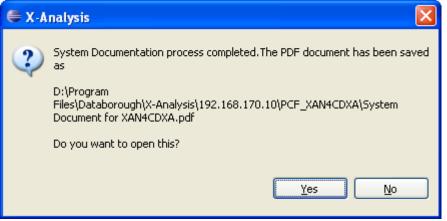


Component Documentation –	Wizard Screen-IV
X-Analysis	
System Documentation - Finish	
Define the Page Size and Contention Resolution Opti	on
Selected Sequence	Level Settings
Screen Components Header Information Data Content Screen Actions Screen Design Residual Logic Business Rules - Summary	Residual Logic Level 4
	Paper Size
	OLetter (8.5" × 11")
	• A4 Size (8.27" x 11.69")
Contention Resolution System Documentation creates documents in Applic Folder is shared, and documents are created/opene progress, then this may lead to contention. Please select appropriate options to enable resolut O Do not overwrite O	ed while the documentation is in
⊙ Create document by similar name O t	Exit/Skip document creation
Reck Next >	Finish Cancel

Here, you can see all selections that he has made and can also define various options related to document formatting like 'Paper Size' and 'Contention Resolution'.

Click **Finish** to generate the document. The Progress status is displayed on screen while generating the system document. The document will be located in the specified save location. After the documentation process is over, the following screen is displayed by X-Analysis to open the generated document:

X-Analysis dialog prompting to open the generated document



# Viewing the Generated Document

The following screens display the generated document:

Table of Contents	
🔁 System Document for XAN4CDXA.pdf - Adobe Acrobat Professional	K
File Edit View Document Comments Forms Tools Advanced Window Help	×
🗀 🖶 📋 🖃 🖝 🧅 🌩 1 / 20 🛛 🚺 🖑 🥰 💿 💿 65%	•
SYSTEM DOCUMENT FOR XAN4CDXA	^
TABLE OF CONTENTS LEGENDS	
CUSTMNT101D - Customer Detail Maintenance	
Parameter List for ZZFT01 (CUSTMNT101D)2 Data Content Diagram for ZZFT01 (CUSTMNT101D)	
Screen Action Diagram for ZZFT01 (CUSTMNT101D)	
Migrated Logic for Function ZZFT01 (CUSTMNT101D)	
Business Rules for ZZFT01 (CUSTMNT101D)	
	~
8.26 x 11.69 in < 👘	



#### Header & Parameter information

System Document for XAN4CDXA.pdf - Adobe	Acrobat Professional			
File Edit View Document Comments Forms Tools	Advanced Window Help 🗙			
🗀 🖶 📋 🖃 📾   💠 🄶 🔳 /	20 🛛 🚺 🖑 🥰 💿 🖲 65% 🗸			
System Document for XAN4CDXA	· · · · · · · · · · · · · · · · · · ·			
CUSTMNT101D - Customer Detail Mainte	enance			
1. Header Information for ZZFT01 (CUSTMN	IT101D)			
Name	Value			
Title	Customer Detail Maintenance			
Function Type	R (Record)			
Re Engineered Function	N			
Attached Grid				
Attached Trailer	ZZFT01			
Entry Mode	N			
Grid with Add N				
2. Parameter List for ZZFT01 (CUSTMNT101D)				
Field Name Description	Type Length Decimal Position			
DSDCDE Distributor >	A 2 0			
8.26 x 11.69 in <				

#### Data Content Diagram

🔁 System Document for XAN4CDXA.pdf - Adobe Acrobat Professional		×
File Edit View Document Comments Forms Tools Advanced Window Help		×
🗀 🖶 📋 🖃 📽 🧅 🌩 🔺 / 20 🛛 🗽 🖑 🥰 💌 🖲	65%	]•
System Document for XAN4CDXA		
3. Data Content Diagram for ZZFT01 (CUSTMNT101D)		<u> </u>
J , , ,		
		-
C DISTS - Distributors		
<ul> <li>Fields</li> </ul>		
DNAME -		
DSDCDE - Distributor > CUSTS - Purchases		
<ul> <li>Joins - No Join Rule Exists</li> </ul>		
<ul> <li>Fields</li> </ul>		
XWBCCD - Customer No		
🖯 WorkField -		
<ul> <li>Fields</li> </ul>		
RECNAM -		
• SFIELD -		×
8.26 x 11.69 in <	>	J



	Screen Action Diagram														
х s	yster	m Doc	ume	nt for	XAN4CDX	(A.pdf	- Adob	oe Acroba	t Prof	fessio	nal				×
File	Edit	View	Doc	ument	Comments	Forms	Tools	Advanced	Wind	Jow H	lelp				×
ſ			B	-	<b>*</b>	Þ 🔿	5	20	1		Ŋ Q	6 😑	۲	65%	]•
	Syst	tem D	ocun	nent fo	or XAN4CD)	XA									^
	4. S	creen	n Act	ion Di	iagram for	ZZFT0	1 (CUS	STMNT10	ID)						
		🗆 Cu	stomer	Detail M	laintenance - Cl	USTMNT10	)1D (ZZF	T01)							
															~
8	.26 x 1	11.69 ir	n	<										>	

#### Screen Design (Re-engineered Screen)

🔁 System Document for XAN4CDXA.pdf - Adobe Acrobat Professional									
File Edit View Document Comments Forms Tools Advanced Window Help	×	:							
🗀 🖶 📋 🖃 📽 🧅 🍦 🙆 / 20 🛛 ኲ 🖑 🥰 💌 🖲	65% •								
System Document for XAN4CDXA	1								
5. Screen Design for ZZFT01 (CUSTMNT101D)	5. Screen Design for ZZFT01 (CUSTMNT101D)								
Customers Customer Detail Maintenance	Databo								
Customer No									
Customer Name									
Statement Account .									
Related Account									
Tax Reg									
Bank	~	/							
11.69 x 8.26 in <	>								



#### **Business Process Logic** 🔂 System Document for XAN4CDXA.pdf - Adobe Acrobat Professional -File Edit View Document Comments Forms Tools Advanced Window Help × sin 7 / 20 65% Ik H 6. Migrated Logic for Function ZZFT01 (CUSTMNT101D) ~ INITIALIZE // Mainline Code // Entry parameters // Initialise message subfile *IN82 = '1' %SUBST(ZZPGM:1:8) = 'CUSTMNT1' SWBCCD - KWBCCD (GETREC) // - Set date ZZDATE - *DATE ZYR = %CHAR(*YEAR) FILLR1 = 1-1 ZMTH = %CHAR (*MONTH) 11.69 x 8.26 in 🔣 >

#### **Business Rules**

🔁 System Document for XAN4CDXA.pdf - Adobe Acrobat Professional 📃 🗖 🔀								
File	Edit View Docu	ment Comments Forms To	ols Advanced Window Help 🗙 🗙	:				
	) 🖶 🗒 I	🖃 📽 🛛 💠 📄	19 / 20 🛛 🚺 🖑 🥰 💿 🖲 65% 🗸					
System Document for XAN4CDXA								
	7. Business Rules for ZZFT01 (CUSTMNT101D)							
-	Rule No.	Annotation	Rule					
	00001		SWBCCD = blank					
	00002		Rep not found on Salespersons					
	00003		Distributor not found on Distributors					
	00004		Cus_No = 0					
	00005		Cus_No not found on Sites					
	00006		Debtor found on Purchases					
	50001		Field range is from 0 to 99999.					
11.69 x 8.26 in								

# **Appendix D – XREDOAPP Command**

The **XREDOAPP** command is the master interface to control an X-REDO application. The Library List needs to be set correctly before using this master command.

# SET THE LIBRARY LIST

Change the Library List to ensure the following sequence:

- XAOBJ
- QGPL
- **QTEMP**

Use the EDTLIBL command to set the library list.

				a ser cen				
Edit Library List								
				System: DBSPW6				
Type new/	changed info	rmation, press	Enter.					
~								
Sequence		Sequence		Sequence				
Number	Library	Number	Library	Number Library				
0		150		300				
10	XAOBJ	160		310				
20	QGPL	170		320				
30	QTEMP	180		330				
40		190		340				
50		200		350				
60		210		360				
70		220		370				
80		230		380				
90		240		390				
100		250		400				
110		260		410				
120		270		420				
130		280		430				
140		290		440				
				More				
F3=Exit	F5=Refresh	F12=Cancel						

#### EDTLIBL command screen

After updating the Library List, type the **XREDOAPP** command and press **ENTER**. The following screen (similar) should appear:



X-Analysis/4	X-Redo Application Control	Databorough Ltd.
XARREDOAPP		11:49:25 21 Jan 2013
Enter options, press Enter		21 0an 2015
5 4 4	Attributes 8=Libraries 12=Ini	
	rate 17=Failures 18=Errors 1 22/23=Compile Chk 24=Prb.Anl.	5
20 A H BOG ZI TITE CHECK	22/25 compile on 21 115.mit.	
X-ref Lib Text	Company/div	vision
AA2EDEMO X-2E Hospita	al Demo	
XAN4CDXA XAN4CDEM Tut	torial System	
F1-Holp F3-Evit F10-Cmd	Line F12=Cancel F24=More Key	N.C.

## **OPTIONS AVAILABLE ON THE XREDOAPP COMMAND INTERFACE**

The following options are available on the **XREDOAPP** command interface:

- Option 2 = Linking
- Option 3 = Copy

LEGACY

- Option 6 = Date Attributes
- Option 8 = Libraries
- Option 12 = Initialise
- Option 15 = Business Rules
- Option 16 = Generate
- Option 17 = Failures
- Option 18 = Errors
- Option 19 = Load Log
- Option 20 = X-A Log
- Option 21 = File Check
- Option 22 = Compile Check
- Option 24 = Prb. Anl.
- Option CT = Prj Ctl

## **Option 2 = Linking**

LEGACY

**Option 2** can be used to link multiple applications. To use the **Linking** option some Data Areas need to be updated. The following screen displays the 'Linking' window:

#### LINKING option – Work with Data Areas

X-Analysis XARWKDARAS	Work with Data Areas	Databorough Ltd. 11:49:25 2013-01-21
Enter options, press Enter 5=Work with values	er.	
Data Area		
XS2ELKPRJ: Linked Pro XS2EMNPRJ: Main Proje XS2EPXLIB: Program Ob	-	
F3=Exit, F12=Cancel		

### Linked Project

To display/edit the 'Linked Project' Data Area, use **Option 5** against it. The following similar window appears:

Work with Data Areas – Linked Project			
X-Analysis XARWKDARAS	Work with Data Area Values	Databorough Ltd. 11:49:25 2013-01-21	
Enter options, pres 2=Change value	s Enter.		
Description		Current Value	
Linked Project L	ibrary Name		

### Use **Option 2** to change the value of the Data Area – Linked Project.

## Change value of Data Areas – Linked Project

X-Analysis	Change Data Area Value	Databorough Ltd.
XARWKDARAS		11:49:25
		2013-01-21
Linked Project L	ibrary Name	
_	-	

#### Main Project

LEGACY

To display/edit the 'Main Project' Data Area, use **Option 5** against it. The following similar window appears:

#### Work with Data Areas – Main Project

X-Analysis XARWKDARAS	Work with Data Area Values	Databorough Ltd. 11:50:15
Enter options, 2=Change value	press Enter.	2013-01-21
Description		Current Value
Main Project	Library Name	

Use **Option 2** to change the value of the Data Area – Main Project.

#### Change Value of Data Areas – Main Project

X-Analysis XARWKDARAS	Change Data Area Value	Databorough Ltd. 11:50:27
		2013-01-21
Main Project Library Name	2	

#### **Program Object Exclusion Library**

This X-2E feature allows the user to exclude the programs from reengineering them when the program objects are in the specified library. This feature is directly controlled by **XS2EPXLIB** data area. If the user wants to exclude the programs from a particular library then that library name can be specified in the **XS2EPXLIB** data area. The default value is blank.

To display/edit the 'Program Object Exclusion Library' Data Area, use **Option 5** against it. The following similar window appears:

#### Work with Data Areas – Program Object Exclusion Library

X-Analysis XARWKDARAS	Work with Data Area Values	Databorough Ltd. 11:50:27 2013-01-21
Enter options, 2=Change value	press Enter.	
Description		Current Value
Program Obje	ct Exclusion Library	



Use **Option 2** to change the value of the Data Area – Program Object Exclusion Library.

#### Change Value of Data Areas – Program Object Exclusion Library

-			
I	X-Analysis	Change Data Area Value	Databorough Ltd.
	XARWKDARAS		11:50:27
			2013-01-21
	Program Object Exclus	ion Library	
I			

## **Option 3 = Copy**

Option 3 copies the X-REDO Application Control settings to a new library. The following screen displays the 'Copy' window:

	Sciccii	displaying copy option	
X-Analysis/4 XARREDOAPP	X-Redo	Application Control	Databorough Ltd. 11:51:11
			21 Jan 2013
X-ref Library		X-2E Hospital Demo	
Text		X-2E HOSPICAL Demo	
Index src files			
Process var & bound calls. Include obsolete source .		Y	
Build data model			
Data model match value .			
TCPIP address			
0361 ID	•••		
F1=Help F3=Exit	F12=	Cancel	

## Screen displaying Copy option

## **Option 6 = Date Attributes**

**Option 6** can be used to change the SYNON shipped date types. The following screen displays the 'Date Attributes' window:

Change	Date Attr	ibutes

WORK WITH DATA IN Format :		Mode : File :	
S2DTATR:			
F3=Exit	F5=Refresh	F6=Select form	at



F9=Insert

F10=Entry

F11=Change

## **Option 8 = Libraries**

**Option 8** can be used to set up library list for the X-REDO application. The following screen displays the 'Libraries' window:

Libraries	screen
-----------	--------

X-Analysis/4 Work with X-Analysis XARWKLIB	/4 Application Libraries Databorough Ltd. 11:51:11 21 Jan 2013
Selected x-ref Library -> : AA2ED	EMO
Enter options, press Enter. 2=Change 4=Delete 5=Display	
Type Sequence Library	
S .00 X2EGEN	
0 .00 X2EGEN M .00 X2EMDL	
F1=Help F3=Exit F6=Ad	d F12=Cancel F16=Print

The **F6** function key can be used to add new library as shown below:

#### Add New Libraries screen

X-Analysis/4 XARWKLIB	Work with X-An	alysis/4 Application Libraries	Databorough Ltd. 11:51:11
			21 Jan 2013
X-ref library.	AA2EDEMO		
Туре	М	(O=Object,S=Source,M=2E Model	)
Sequence	.00		
Library			

This screen is used to set up the source, object and model libraries for the selected application. If you intend to build the data model using CA 2E model libraries, then you should enter the names of those libraries here, specifying the library type as "M".

These libraries are used when initializing the application and for various other commands which need this information.

The maximum number of libraries allowed for each type is 300.

Two items of data are held against each library name:

Library type – O - Object, S - Source or M - 2E Model type of libraries

**Sequence Number** – It determines the order in which the libraries are placed in the library list.

## **Option 12 = Initialise**

LEGACY

**Option 12** can be used to initialise the X-REDO Application Library. The following screen displays the 'Initialise' window:

```
Initialise screen
                      Initialise X-Analysis/4 (XAXREF)
Type choices, press Enter.
X-Analysis Library . . . . . . > AA2EDEMO
                                                Name
Object Libraries . . . . . . . *SPECIFIED
                                                Name, *SPECIFIED
              + for more values
Source Libraries . . . . . . *SPECIFIED Name, *SPECIFIED, *NONE
              + for more values
Index Source Files . . . . . . > *ALL
                                                *CHG, *NO, *ALL, *UPG
Build Data Model . . . . . . . > *YES
                                                *YES, *NO
Generate Business Rules . . . > *YES
                                                *YES, *NO
Initialise X-Resize . . . . *NO
Include obsolete source/object *NO
                                                *YES, *NO
                                                *YES, *NO
Import 2E Model . . . . . . . > *MODEL
                                               *CODE, *MODEL
                                                                       Bottom
F3=Exit
         F4=Prompt
                     F5=Refresh F12=Cancel F13=How to use this display
F24=More keys
```

## **Option 15 = Business Rules**

**Option 15** can be used to generate Business Rules for a single application area, or for the entire application. The following screen displays the Business Rules window:

#### Generate Business Rules screen

Generate Business Rules (XGENBRULES) Type choices, press Enter. X-Analysis X-Ref Library . . . > AA2EDEMO Name X-Rev Library . . . . . . . *XALIB Name, *XALIB X-Analysis Application Area . . *ALL Character value, *ALL, *PGM Bottom F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display F24=More keys

This command will identify the business rules logic in each program in the application over which the specified X-Analysis cross-reference database has been built.

LEGACY

A source member containing the business rule logic and narrative describing each rule is generated for each program.

## **Option 16 = Generate**

**Option 16** can be used to generate the new RPGLE application programs. The following screen displays the 'Generate' window:

GENERATE screen					
Re-engineer Programs (XREGENP)					
Type choices, press Enter.					
Program Name *AREA Name, *AREA, *ALL X-Analysis Library > AA2EDEMO Name New Pgm Suffix R Character value Restructure Interactive Pgms . *YES *YES, *NO Compile the Re-engineered Pgms *YES *YES, *NO					
Bottom F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display F24=More keys					

## **Option 17 = Failures**

**Option 17** can be used to list program failure from the 'Generate' (**Option 16**) job. The following screen displays the 'Failures' window:

Failures Report							
	Display Report						
				Report widt	h	: 84	
Positio	on to line			Shift to column	1	•	
Line	+1.	+2.	+3	+4+	5+6.	+7	
	X2RDAT	X2RTIM					
000001	2011-07-29	09.14.14	A1002498	File Y2CFGTLO i	s missing.		
000002	2011-07-29	09.14.14	A1002498	Failed to compi	le.		
000003	2011-07-29	09.14.14	A1002499	File Y2CFGTLO i	s missing.		
000004	2011-07-29	09.14.14	A1002499	Failed to compi	le.		
000005	2011-07-29	09.14.14	A1002500	File Y2CFGTLO i	s missing.		
000006	2011-07-29	09.14.14	A1002500	Failed to compi	le.		
000007	2011-07-29	09.14.14	A1002503	File Y2DSTFLO i	s missing.		
000008	2011-07-29	09.14.14	A1002503	Failed to compi	le.		
000009	2011-07-29	09.14.14	A1002504	File Y2DSTFLO i	s missing.		
000010	2011-07-29	09.14.14	A1002504	Failed to compi	le.		
000011	2011-07-29	09.14.14	A1002505	File Y2DSTFLO i	s missing.		
000012	2011-07-29	09.14.15	A1002505	Failed to compi	le.		
000013	2011-07-29	09.14.15	A1002527	File Y2CFGTL1 i	s missing.		
000014	2011-07-29	09.14.15	A1002527	Failed to compi	le.		
000015	2011-07-29	09.14.15	A1002528	File Y2CFGTL1 i	s missing.		
000016	2011-07-29	09.14.15	A1002528	Failed to compi	le.		
						More	
F3=Exit	F12=C	ancel	F19=Left	F20=Right	F21=Split		



## **Option 18 = Errors**

**Option 18** can be used to list compile time errors for program failures from the 'Generate' (**Option 16**) job. The following screen displays the 'Errors' window:

	Errors Report					
			Display Re	eport		
				Report wi	ldth	.: 350
Positi	on to line		S	Shift to colu	umn	
Line	+1	+2	.+	+ 4 +	+	6+7
	Source	Source	Source	Compiler	Compile	Compile Ob
	Library	File	Member	Command	Date	Time
*****	*******	End of report	******			

## **Option 19 = Load Log**

**Option 19** can be used to display any notifiable errors encountered in any of the Generate processes. The following screen displays the 'Load Log' window:

Load Log Report screen Display Physical File Member XS2ELDLOG File . . . . . : Library . . . : AA2EDEMO Member . . . . : XS2ELDLOG Record . . . . : 3 Control . . . Column . . . . : 1 Find . . . . . . *...+...1...+...2...+...3...+...4...+...5...+...6...+...7...+... A1002920 Q2ESRC2 AA2EDEMO XRRVY2EEPDY2DLSHL0 Missing access path for entr ***** END OF DATA ***** Bottom F20=Right F3=Exit F12=Cancel F19=Left F24=More keys

## **Option 20 = X-Analysis Log**

**Option 20** can be used to display an audit of X-Analysis and Generate processes. The following screen displays the 'X-Analysis Log' window:

#### X-Analysis Log Report screen

Display Physical File Member					
File : XA4LO	G Library	: AA2EDEMO			
Member : XA4LO	G Record	: 367			
Control B	Column	: 1			
Find					
*+1+2+.	3+4+5	+6+7+			
2012-08-1005.43.33AA2EDEMO	XREGEN Program: TSAHSRR	MANOJK			
2012-09-1212.00.48AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK			
2012-09-1212.03.29AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK			



2012-09-1212.04.02AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK
2012-09-1212.08.07AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK
2012-09-1212.51.06AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK
2012-09-1213.34.42AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK
2012-09-1213.35.36AA2EDEMO	XREGEN Program: TSBMPFR	MANOJK
2012-09-2510.23.20AA2EDEMO	XA4INIT Application Initialization	n STUART
2012-09-2510.23.41AA2EDEMO	XDMODEL *CA2E	STUART
2012-09-2510.24.13AA2EDEMO	XREENGPGMS*ALL programs	STUART
2012-09-2510.24.14AA2EDEMO	XGENBRULES*ALL programs	STUART
2012-09-2510.39.20AA2EDEMO	XREGEN *ALL programs	STUART
2012-10-0312.58.16AA2EDEMO	XREGEN *ALL programs	TESTER
*	***** END OF DATA *****	
		Bottom
F3=Exit F12=Cancel F19=	Left F20=Right F24=More keys	

## **Option 21 = File Check**

**Option 21** submits the **XCMPDB2MDL** command to batch. This option identifies all the programs and identifies any missing display files, printer files, physical files and access paths files. It also identifies field errors. It can be run over the entire application or application areas. The file results can be found in X2EDBERR and all associated programs can be found in X2EDBEPG.

```
File Check ReportCompare Database to Model (XCMPDB2MDL)Type choices, press Enter.X-Analysis X-Ref Library . . . > AA2EDEMOX-Analysis Application Area . . *ALLCharacter value, *ALLF3=Exit F4=Prompt F5=RefreshF12=CancelF13=How to use this displayF24=More keys
```

## **Option 22 = Compile Check**

**Option 22** submits **XGENORGOBJ** command to batch. This option compiles all the original programs in **QTEMP**. It can be run over the entire application or application areas. All failures are logged in **X2EGCMLOG** and the associated error records are logged in **X2ECPLLOGO**. In addition, any original programs which fail to compile are written to the exclusion file, **X2ERGNEXS**. The programs listed in the exclusion file are not generated as part of **Option 16**, **XREGENP**.

```
Generate Original Objects (XGENORGOBJ)
Type choices, press Enter.
X-Analysis X-Ref Library . . . > AA2EDEMO Name
X-Analysis Application Area . . *ALL Character value, *ALL
```

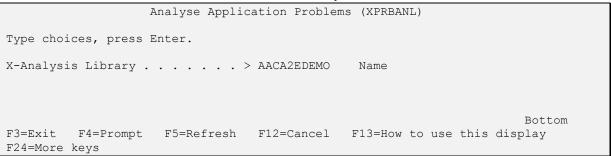


F3=Exit F24=More	-	F5=Refresh	F12=Cancel	F13=How to use this	Bottom display

## Option 24 = Prb. Anl.

**Option 24** can be used to display problems associated with the application. The following screen is displayed when **Option 24** is selected:

Problem Analysis screen



Press **ENTER** to submit a batch job which will execute the **XPRBANL** command in batch mode.

## **Option CT = Prj Ctl**

**Option CT** can be used to work with X2E/RPG Project Control. The following screen is displayed when you select **Option CT**:

#### Problem Control screen

X2E/RPG	Work with X2E/RPG Project Control	Databorough Ltd.
XARWKPRJL	Project: AA2EDEMO Ref'd Project: RF2EDEMO	11:55:12
		21 Jan 2013
Type options	s, press Enter.	
2=Change 4=	Delete 5=Display 7=Notes 8=Comp.Errors 9=Mi	ssing Files
	Issue	
pt Program	Type Category Program Description	Assig'd To
TSAGEFR	E DSPDTASFL Edit Doctor	LYNDAB
TSAWEFR	* E PMTERROR Edit Medication	LYNDAB
	* E SCNDATE EDTRCD Edit Diagnosis	LYNDAB
TSAZETR	* E TRNLOGIC TRN Edit Prescriptions	LYNDAB
		Bottom
-	Lxit F5=Refresh F6=Add F10=Drop/Fold F12=Car	icel F20=Summary
F21=Project N	Notes F22=File Errors	

## **Options under Project Control Screen**

The flow of actions from the 'Work with X2E/RPG Project Control' screen is as follows:

Actions	Options
Report issue picked for a program	F6 – Add / Option 2 - Change
Delete reported issue for a program	Option 4
Display reported program details	Option 5
Notes	Option 7
Compilation Errors	Option 8
Missing Files	Option 9
Summary	F20
Project Notes	F21
File Errors	F22

## F6 = Add

Enter the following information:

Note: Same applies to Option 2 – change the added issue.

#### Program Name

Enter the program's name for which the issue has to be reported.

#### Text

Enter suitable description for the issue.

### Issue Type

Enter issue type.

### Date and Time of event

This is a system-generated field.

### Issue Category

Enter issue category.

## **Category Description**

Enter category description.

### Assigned To

Enter the name of the person to whom the issue is assigned.

#### **Programmer Narrative** Enter note for programmer

## F6 screen – To add issue picked for a program

X2E/RPG	Work with X2E/R	PG Project Cont:	rol	Databorough Ltd.
XARWKPRJL	Project: AACA2EDEM	10 Ref'd Project	t: *NONE	11:53:11
				21 Jan 2013
Program Name				
Text				
Issue Type .				
Date and Time	of event	2013-01-21 10	.43.21	
Issue Categor	у			
Category Desc	ription .			
Assigned To				
Programmer Na	arrative			

**Option 4 – Delete** Use this option to delete the reported issue.

## Option 5 – Display

LEGACY

Use this option to display the reported issue.

#### **Option 7 – Notes**

Use this option to provide notes related to the issue.

#### **Option 8 – Comp. Errors**

Displays Compilation Errors for the program.

#### **Option 9 – Missing Files**

Displays Missing Files required by the program.

#### F20 – Summary

Displays Project Summaries. The user can see various project summaries by opting for F15.

## **F21 – Project Notes** Displays Project Notes.

**F22 – File Errors** Reports the File in Errors



F22 screen –	Files in	Error
--------------	----------	-------

X2E/RPG XARWKDBI			th X2E File Errors EMO Ref'd Project: RF2EDEMO	Databorough Ltd. 11:56:21 21 Jan 2013
Error	File	Field	Description	
FFD0001	EDAAPI		File: EDAAPI not in XOBJECT	
				Bottom
F1=Help	F3=Exit	F12=Cancel		Boccom

# X-2E DATA AREAS

The user can customize the X-2E settings to meet the project-specific needs. These can be controlled by the data areas available in the X-Analysis cross-reference library. The purpose of each data area has been detailed below:

## Synon Date Fields

This data area indicates that the Date Fields have already been processed. If the process is successful in processing the date fields, it sets the **XS2EDTSRUN** data area to ***YES**. The default value is ***NO**.

## **Synon Entry Parameters**

The entry parameters processing for a Synon application is governed by the reengineering process and the details are maintained in a **XS2ELDLOG** log file. The **XS2EEPVFD** data area is set to ***YES** to indicate that the entry parameters have been processed successfully. The default value is ***NO**.

## Synon Product Library for the Edit Code Definitions

The X-2E reengineering process is capable of obtaining the edit codes definitions stored in **YEDTCDERFP** file. The **XS2EEWLIB** data area has a value 'Y2SY' by default, which helps in locating the base product library for the 'PRD Edit code definitions' file. You can change the data area value to suit your environment. As an example, 'Y1SY' is another base product library.

# Synon Edit Code Definitions Processed

X-2E has the requisite capability to integrate the Synon edit code definitions into the X-Analysis edit code definitions table, **XEDITC**. This in turn will be accessed by the reengineering process, when required. The process sets the **XS2EEWRUN** data area to ***YES** if the Synon edit code definitions are successfully processed, else it will remain unchanged. The shipped value is ***NO**.

## Synon Field Mapping Fix

The X-2E reengineering process maintains the field mapping data in X-2E databases. The value in the **XS2EFIEFIX** data area will be set to '***YES**' if the reengineering process manages to fix both external and internal Synon field mappings successfully. By default, the **XS2EFIEFIX** data area is set to '***NO**'.

## Synon EXCUSRSRC Function

The residual logic is a high-level view of a Synon program. The X-2E feature allows the user to merge the user source (invoked by **EXCUSRSRC** function) into the Synon program to present a complete view of the residual logic. By default, this functionality is always available and the **XS2EMRGEUS** data area is set to ***YES**. If it is changed to ***NO**, then the X-2E process will not merge the user source into the Synon program.

## Synon Debug Data

This X-2E feature allows the user to maintain the Synon debug data in the **XS2EDEBUG** file in the cross-reference library. To enable this feature, the user needs to change the value of the **XS2ERUNDBG** data area to ***YES**. By default, the data area XS2ERUNDBG is set to ***NO**.

## Synon Consolidated RTVCND Values

The X-2E reengineering process creates the **RTVCND** values in the **XS2EYYCNDX** table. This is a special feature which works only when the user sets the value of the **XS2EYYRUN** data area to ***YES**. By default, it is set to ***NO**.

## Synon Prototype Library

By default, the Synon base product library is set to 'Y2SY' for the various X-2E functionalities. In case it does not match your setup, then change the **XA2EPROLIB** data area to suit your environment. As an example, 'Y1SY' is another base product library.



# **Appendix E – Overriding Data Tables**

# SYNON FUNCTION KEY / OPTION DEFAULTS

The **XS2EFODFT** table identifies default function keys and options, their texts and action type. Applications may re-assign the *PREVIOUS key from **F12** to **F24**, and use "A" for *DELETE and "Z" for *DETAIL.

			Table Structure for XS2EFODT
Α	R XS2EFODF	TF	
Α	S2ODTYP	1A	TEXT('Function Key/Option')
Α	S2ODVAL	2A	TEXT('Value')
Α	S20D0VL	2A	TEXT('Override Value')
Α	S2ODTXT	50A	TEXT('Text')
Α	S2ODACT	20A	TEXT('Action')
A*			
Α	K S2ODTYP		
Α	K S2ODVAL		
A*			

## Default Values of the Table XS2EFODT

S2ODTYP	S20DVAL	S2ODOVL	S2ODTXT	S2ODACT
F	03		Exit	*EXIT
F	09		Add/Change	*ADD/*CHANGE
F	11		Delete	*DELETE
F	12		Cancel	*PREVIOUS
0	01		Select	*SELECT
0	04		Delete	*DELETE
0	05		Display	*DETAIL

#### Example – Modified Values for the Table XS2EFODT

S2ODTYP	S20DVAL	S2ODOVL	S2ODTXT	S2ODACT
F	03		Rinucia	*EXIT
F	09		Modo <inser>::Modo <modif.></modif.></inser>	*ADD/*CHANGE
F	11		Annullamento	*DELETE
F	12	24	Ritorna	*PREVIOUS

S2ODTYP	S20DVAL	S2ODOVL	S2ODTXT	S2ODACT
0	А		Cancellazione	*SELECT
0	Z	Zoom		*DELETE
0	01		Selezione	*DETAIL

# SYNON FUNCTION KEY/OPTION EXTRA DEFAULTS

The **XS2EFOXTR** table details additional function key usage. In some applications, **F12** could be an extra default function key for the functions listed.

			Table Structure for XS2EFOXTR
Α	R XS2EFOXT	RF	
Α	S2OXTYP	1A	TEXT('Function Key/Option')
Α	S2OXVAL	2A	TEXT('Value')
Α	S2OXFNT	10A	TEXT('2E Function Type')
A*			
Α	Κ S2OXTYP		
Α	K S2OXVAL		
A*			

## Sample Values for XS2EFOXTR

S20XVAL	S2OXFNT				
12	PMTRCD				
12	DSPRCD				
12	EDTRCD				
12	SELRCD				
	12 12 12				

# **Appendix F – X2E Specific Features**

The X2E reengineering process is a two-part process.

- 1. Reengineering of non-2E programs and EXCUSRSRC members.
- 2. Reengineering of 2E programs.

# **REENGINEERING OF NON-2E PROGRAMS**

This entails the following steps:

## **Generate Business Rules**

In this process, the business rules are generated and object/source level information i.e. Files used in the program, External data structure declared in a program, program calls, file/field info, entry parameters, program declared fields, actual source code and other object-related information is extracted and stored in various X-Ref files. This information is then used by X2E reengineering process to create procedure-based module/service program.

## **Reengineer Programs**

### Program Restructuring

Here, the original RPG/COBOL source code is converted from language-specific syntax into a general format (e.g. MOVE/MOVEL/ADD/SUB etc. statements get converted into ASSIGN with proper conversion). In case of interactive program, the source code gets restructured to extract each logical screen as an equivalent function and related processing logic. Thereby, each logical screen is recovered as an equivalent function to be converted into JSF (Java) / XAML (Silverlight). The batch programs are simply converted without any restructuring. The restructured code is stored in the X-Ref library.

### Service module generation

Having restructured the code, the process creates procedure-based module and service programs with all subroutines/procedures converted into procedures. For interactive programs, the exportable procedures are created for the functions which could be used either from the controller Javabean or from RPG screen controller module.

### Refactoring

In this process, all the special characters (i.e. #, @ or \$) which are not allowed in java literals are replaced with allowed characters to make a valid Java/C# literal. If a special character is used on a PF/LF, a new LF is created by renaming the fields with the java-acceptable names. The original file is then replaced in the program with the new file along

with the new fields throughout the program. In case a program contains a Display/Printer File and that file contains special characters in field names, a new file with the same name is created in X-Ref library. The newly-created file contains java compatible field names and the necessary changes (due to renaming of fields and record formats) are reflected in RPG program.

The data structures (except PSDS, INFDS and Externally-described DS – the Java generation takes care of it suitably) too are converted to standalone fields and the additional code (to reflect the operation on DS/subfields on all its individual converted standalone fields) gets added in the generated procedure-based module.

The assignment of compile time data to the corresponding arrays is also done from the initialise procedure. The conversion on the keyed data structures and Eval-Corr operations is also done in Java-acceptable format.

In the case of EXCUSRSRC, no refactoring and service module generation takes place. However, in order to handle special characters, the process replaces the special characters in the field names/ source code of the specific program as stored in one of the crossreference files.

## **Reengineer 2E programs**

The X2E reengineering process refers the 2E model files to extract various details about the functions, fields, files, access paths, conditions, etc. This information is then held in the various cross-reference files created for the purpose. Once the basic information is extracted, the action diagrams of the 2E members are generated from 2E model files. The process then creates the procedure-based RPG source from the action diagram. If a specific 2E member includes any EXCUSRSRC type member, its content (which is recovered and stored in cross-reference files) gets appended. The field definitions of the EXCUSRSRC member are also appended to the program using it.

The parameters (e.g. starting with #I, #O or #B are renamed to start with II, OO and BB) are set accordingly with the long field names which have been passed as the actual parameter from the calling 2E program's action diagram. The example below illustrates this:

### **DRPRDFR Action diagram (snippet)**

```
// Execute function Scan.
EXECUTE FUNCTION(Scan) TYPE(EXCUSRSRC);
PARAMETER(RCD.Oms_status);
PARAMETER(CTL.Oms_status_p12);
PARAMETER(LCL.Scanresult);
```

Execute user source - content of "Scan"

```
* Scan for search string
* Parameters :
```



* * * *	<pre>input : #ixutx input : #ixvtx output #Ounnb</pre>	: zoekstrin		ring	
D	up lo	C C		<pre>const('ABCDEFGHIJKI TUVWXYZ') const('abcdefghijkl tuvwxyz')</pre>	_
	ulen	s	3 0	,	
	Initialize param				
С		movel	*blank	uscan1	80
С		movel	*blank	uscan2	80
С		movel	*blank	utran1	80
С		movel	*blank	utran2	80
С		z-add	*zero	uresul	3 0
C * C * C	Te onderzoeken s Zoekstring saver Lengte van de zo Startpositie in	movel in uscanl movel pekstring be eval	<pre>#ixutx #ixvtx palen ulen=%le</pre>	uscan2 uscan1 en(%trim(uscan1))	3 0
C * C *	Translate USCANI lo:up Translate USCAN2 lo:up Find argument	xlate 2 to Upperca xlate	uscan1 se uscan2	utran1 utran2	
C C	utran1:ulen	if	%Error	-	
C C		z-add else	999	#ounnb	
C C C		z-add endif	uresul	#ounnb	

Code snippet of the generated procedure-based module:

```
IIXUTX = Oms status;
IIXVTX = SELOms_status;
uscan1 = *blank;
uscan2 = *blank;
utran1 = *blank;
utran2 = *blank;
uresul = *zero;
uscan2 = iixutx;
uscan1 = iixvtx;
ulen = %len(%trim(uscan1));
upos = 1;
utran1 = %xlate(lo:up:uscan1);
utran2 = %xlate(lo:up:uscan2);
uresul = %scan(%subst(utran1:1:ulen):utran2:upos);
if %Error;
oounnb = 999;
else;
oounnb = uresul;
```

### endif;

#### Scanresult = OOUNNB;

Let us closely look at the artifacts recovered by the X2E Reengineering process, i.e.:

- 1. Action Diagram
- 2. Business Rules
- 3. Residual Logic
- 4. Re-engineered Action Diagram
- 5. Re-engineered Controller
- 6. INTERNAL ROUTINES Objects
- 7. Business Process Logic Metrics

## **ACTION DIAGRAM**

The X-Analysis Initialization process uses 2E Model to generate Action Diagrams in the cross-reference library. On the X-Analysis Perspective, double-click the **Programs** node under the selected cross-reference to bring up the list of all programs.

Double-click on a program to zoom source into its corresponding Action Diagram (see below).

Programs	- 8
Action Diagram for ER Edit Hospital Edit record(1 screen)(TSAJE1R)	待一
📃 • 🛃 🖉 🚏 • 💵 • 🍓 📓 🤉 • 🖨 🔯 • 🚺 •	
Action Diagram	^
😑 /* Data Section */	
Workfield	
/* Program logic for ER Edit Hospital Edit record(1	scre
USER: Initialize detail screen (new record)	
WRK.Number_4 = $*ZERO$	
WRK.Number_5 = *ZERO	
WRK.Number_7 = $*ZERO$	
WRK.Alpha_6 = *BLANK	
DTL.Country = RTVCND(DTL.Country_Name)	
USER: Initialize detail screen (existing record)	×
	2

Action Diagram for a program

Note that the 'Call' has a '+' before it indicating that the program being called has parameter(s).

# **BUSINESS RULES**

Opt for the **Business Rules** option from the **Source Options** drop-down menu on the Action Diagram toolbar.

Business Rules option on the Action Diagram toolbar							
Se Programs 🖹 🤉 TSAJE1R 🔀							
Action Diagram for ER Edit Hospital Edit record(1 screen)(TSAJE1R)	待一						
🗏 • 🛃 🖉 🖗 • 💵 • 🐜 📓 🗵 • 🖨 🛍 •							
Original Source Code	_						
Business Rules Minuted Lasia							
Migrated Logic 'S a /* Program logic for ER Edit Hospital Edit record(1	screi						
	>						

On selecting the **Business Rules** option, the following screen is displayed:



指 Programs	🖹 🔍 TSAJE1R	X		- E				
Business Rules for TSAJE1R in AA2EDEMO/Q2ESRC								
	🗐 + 🛃 🚼 - 👘 - 💵 - 🔚 📓 🗩 - 🖨 🔯 -							
Business Rul	Business Rules							
/* Program	n logic for	ER Edit Hospi	tal Edit	record(l screen) (TSAJE1R)				
🖃 USER: Init	tialize det	ail screen (ne	w record)					
WRK.N	Jumber 4 = 5	*ZERO			1			
	_ Jumber 5 = 3							
	Jumber 7 = 3							
	lpha 6 = *H							
		TVCND (DTL. Count	-ra Nomo'					
		ail screen (ex:	—	acrd)				
			iscing re	cora)				
	lumber_4 = 3							
	lumber_5 = 3							
	lumber_7 = 3							
WRK.A	lpha_6 = *H	BLANK						
🕀 USER: Dele	ete DBF rec	ord						
😑 USER: Val:	idate detai	l screen field	3	~				
<								
🛃 Business Rules			Ŕ	🖌 🖉 🏹 🎜 🗟 🔻 🔟 • 購 🖵 [				
Business Rules for 1	TSAJE1R, Numb	er of Lines: 12						
Source Member	Rule Number	Field	File	Rule				
TSAJE1R	00001	Country	TSACREP	IF DTL.Hospital Country is South Africa				
TSAJE1R	00002	Address_Post_Zip	TSACREP	IF DTL.Hospital Address Post/Zip is Rang	е			
TSAJE1R	00003	Country	TCACDED	IF *OTHERWISE				
TSAJE1R TSAJE1R	00004 00005	Country Address_Post_Zip	TSACREP TSACREP	IF DTL.Hospital Country is United Kingdo IF DTL.Hospital Address Post/Zip is Rang				
TSAJEIR	00006	Hudiess_rost_zip	DACKER	IF *OTHERWISE	9			
TSAJE1R	00007	Country	TSACREP	IF DTL.Hospital Country is United States	ol			
TSAJE1R	00008	Address_Post_Zip	TSACREP	IF DTL Hospital Address Post/Zip is Rang				
TSAJE1R	00009			IF *OTHERWISE				
TSAJE1R	00010	Country	TSACREP	IF DTL.Hospital Country is Canada				
TSAJE1R TSAJE1R	00011 00016	Address_Post_Zip Address_Post_Zip	TSACREP TSACREP	IF WRK.Alpha 6 NE DTL.Hospital Address IF *OTHERWISE	; F			
	00010	Muuress_Post_2lp	DACKEP					
<					>			

This also opens an additional Business Rules summary window listing all the business rules for the program.

# **MIGRATED LOGIC**

The Migrated Logic is the reorganized/restructured view of what is shown in the Business Rules view. It is also a precursor of what the generated java code will look like. For this, the program should be reengineered first.

LEGACY

Select the **Migrated Logic** option from the **Source Options** drop-down icon on the Action Diagram toolbar, as shown below:

🕹 Programs 🛛 🖹 🔍 TSA	JEIR 🛛	
Action Diagram for ER E	dit Hospital Edit record(1 screen)(TSAJE1R)	#A -
🗏 • 🗟 🖉 🖗 • 💵 •	🖀 🖬 🗵 - 🖨 🞕 - 🛄 -	
Original Source Code ✓ Action Diagram Business Rules	ction */	
Migrated Logic	d m logic for ER Edit Hospital Edit record(1	screiv
<		>

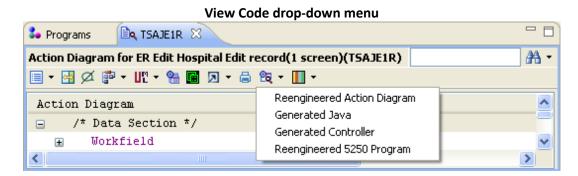
On selecting the Migrated Logic option, the following window is displayed:

	Nigrated Logic Window	
指 Programs	Eq TSAJEIR 🔀	- 0
Migrated Log	ic for TSAJE1R 📃 🔻 🖉 🔻 🛱 🐻 🖨 🗔 👻 🛱 🗸	#A •
Migrate	d Logic	
	rry Parameters for ER Edit Hospital Edit record(1 s	creen
🖽 /* Dat	a Section for TSAJE1R */	
/* Pro	ogram logic for ER Edit Hospital Edit record(1 scre	en) ('
🗄 USER:	Initialize detail screen (new record)	
🗄 USER:	Initialize detail screen (existing record)	
🗄 USER:	Delete DBF record	
🗄 USER:	Validate detail screen fields	
🗄 USER:	Create DBF record	
🗄 USER:	Change DBF record	
🗄 USER:	Process command keys	
⊞ USER:	Exit program processing	
<		>

#### **Migrated Logic window**

# **REENGINEERED ACTION DIAGRAM**

The Reengineered Action Diagram is available only when the Reengineering process is over. The following screen displays the **Reengineered Action Diagram** option from the Action Diagram toolbar:



The Reengineered Action Diagram is the RPGLE member, generated for the Action Diagram. This is created in the name <Program>A e.g. DRPZE1RA.

	Reeng	gineered Action D	Piagram	
指 Programs	🗈 🗈 TSAJE1R	JE1R 🛛		
Source List of	TSAJE1RA in AA2EDEMO/Q	RPGLESRC, Lines: 53	6, Yiew Level: 5	#A -
🛃 🕶 🔚 😭 🕯	1 L			
Seq No	*+ 1+	2+ 3	.+ 4+ 5	+ 6 🔼
0132.00	P InitPgm	b	export	
0133.00	P*			
0134.00	D	pi		-
0135.00	/include X2E	/QRPGLESRC,X2E	PROTO1	
0136.00	/free			
0137.00	aopenfiles(	);		
0138.00	zertnvar =	*blanks;		
0139.00	return;			
0140.00	/end-free			
0141.00	Р	e		~
<				>

# **INTERNAL ROUTINES OBJECTS**

The X-Analysis Initialise process uses the Model information to identify internal routines. This information is maintained in the X2E repository in the **XS2EANXRF** file.

Opt for *INTRTN on the **Work with Objects** dialog. This displays the following screen:



🍫 Object List	×				
Object List o	f *ALLUSR/*ALL/	/*ALL/*ALL/*	ALL/*ALL,	Total Objects: 296	孡
🙀 - 🖨 🗵	•				
Library	Name	Туре	Attribute	Description	2
Ξ	A1002463	*INTRTN		*Notepad	
Ξ	A1002498	*INTRTN		Create *Configuration Tab	
Ξ	A1002499	*INTRTN		Change *Configuration Tab	
Ξ	A1002500	*INTRTN		Delete *Configuration Tab	
Ξ	A1002503	*INTRTN		Create *Distributed File	
	A1002504	*INTRTN		Change *Distributed File	
Ξ	A1002505	*INTRTN		Delete *Distributed File	
Ξ	A1002526	*INTRTN		Determine Recs to Delete	
Ξ	A1002527	*INTRTN		Dlt Table & View Cfg Recs	
Ξ	A1002528	*INTRTN		Ensure RDB Exists on Tab	
Ξ	A1002569	*INTRTN		Retrieve Table for View	
Ξ	A1002572	*INTRTN		NULL FUNCTION	
Ξ	A1002573	*INTRTN		Create Config Recs	
Ξ	A1002576	*INTRTN		Crt Table & View Cfg Recs	
Ξ	A1002579	*INTRTN		Dlt Table & View Y2DSTFP	
Ξ	A1002807	*INTRTN		Convert DT#	
Ξ	A1002808	*INTRTN		Check DT#	
Ξ	A1002809	*INTRTN		Convert TM#	
Ξ	A1002810	*INTRTN		Check TM#	
Ξ	A1002918	*INTRTN		Create *Date List Header	
Ξ	A1002919	*INTRTN		Change *Date List Header	
Ξ	A1002920	*INTRTN		Delete *Date List Header	
Ξ	A1002925	*INTRTN		Create *Date List Detail	
Ξ	A1002926	*INTRTN		Change *Date List Detail	

# **BUSINESS PROCESS LOGIC METRICS**

Select **Audit Options** on the context menu over the cross-reference library and choose the **Business Process Logic Metrics** option from it, as is shown below:



Business Process Logic	Metrics option
AA2EDEMO - X-2E Hosnital Demo Jan 2013	· ·
New Application Area	
式 🛛 Add Alternate Data Library List	
Reset Library List	
Application Library List	
Affinity Comparison	
Refresh Options	
Reset Library List         Application Library List         Affinity Comparison         Refresh Options         Derive Business Rules         Import Options         Export Options         Document Entire Application         Document Changed Objects         Reengineer Programs	
🗽 🚵 Import Options 🔹 🕨	
Export Options	
Document Entire Application	
Document Changed Objects	
> 08 Generate Programs	
Generate Web Services	
▷ BC Generate Data Application	
Data Migration	
Inter-Repository Options	
Audit Options	Metrics Analysis
Dig STAN - stanley	Screen Metrics
⊳ 📴 TESTDBI	File Metrics
D BS TRSBP1 - my first bit	Business Process Logic Metrics
ession Information.	Recovery Error Report

#### aic Motrics ontio

## Window displaying Business Process Logic Metrics

指 Programs	s 🛛 🗎 🔍 TSA	AJE1R 🛛 🔣 Su	ummary Metrics 🛛			
Business Pi	rocess Logic	Audit Report fo	or AA2EDEMO	ê 1	3 -	番・
Name	Total Lines	Included Lines	Excld/FixMe Lines	Unmarked Lines	Total Stmts	Excluded Stmts
A1002463	0	0	0	0	0	0
A1002498	0	0	0	0	0	0
A1002499	0	0	0	0	0	0
A1002500	0	0	0	0	0	0
A1002503	0	0	0	0	0	0
A1002504	0	0	0	0	0	0
A1002505	0	0	0	0	0	0
A1002526	11	0	0	11	10	0
A1002527	4	0	0	4	3	0
A1002528	2	0	0	2	1	0
A1002569	13	0	0	13	11	0
A1002572	0	0	0	0	0	0
A1002573	16	0	0	16	15	0
A1002576	15	0	0	15	14	0 🚩
<						>



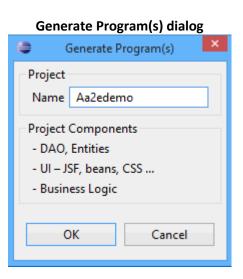
# **GENERATING JAVA APPLICATION**

Once the reengineering process completes, the user can opt to generate a Java application. He can use the **Generate Programs** option available on the context menu over a selected cross-reference library or an application area.

	New Application Area
	Add Alternate Data Library List
	Reset Library List
	Application Library List
	Affinity Comparison
	Refresh Options
	Derive Business Rules
2	Import Options
	Export Options
	Document Entire Application
	Document Changed Objects
	Reengineer Programs
	Generate Programs
	Generate Web Services
	Generate Data Application
	Data Migration
	Inter-Repository Options
	Audit Options

### **Generate Programs option over X-Ref library**

This presents the following dialog:



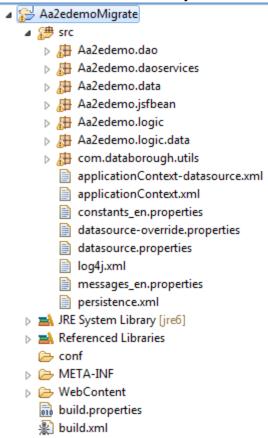
**FRESCHE** LEGACY

Click **OK**. The process generates the following components:

- Java for Business Rules under .logic and .logic.data package.
- DAO components for each Physical file. These are held in .dao, .daoservices and .data packages of the Java project.
- Managed Javabeans (.java) for each JSF under .jsfbean package.
- Java Server Faces (JSF) for each reengineered screen is created under WebContent folder.

The process on completion prompts the user to switch to Java Perspective, if desired. If selected, Eclipse perspective switches to Java and the user gets to see the Java project generated by the Re-generate Programs.

The screenshot below shows the generated Java project with both 'Generate Business Logic & DAO' and 'UI' checkboxes checked.



#### Generated Java Project

The tool also gives the option to review the Reengineered Action Diagram and the generated Java code side-by-side by clicking the **Show Spilt Panel** icon on the Reengineered Action Diagram view.

Object List 🖹 TSAJE1R 🕅 TSAJE1R 🛛	
rce List of TSAJE1RA in AA2EDEMO/QRPGLESRC, Lines: 947, View Level	:5 📴 - 🖽 🕲 🔍 🔠 👫
+ 1+ 2+ 3+ 4+ 5 🔼	
<pre>zgetpgmdta(zmessages:zmsgidx:zstatevar); zgetwrkflds(); zrtncode = *blanks;</pre>	<pre>private void zgetpgmdta(MSGOBJ zmessages[], zmsgidx = 0; clearObj(zmessages); zerror = false;</pre>
select;	<pre>evalCorr(s, zstatevar); for (zidx = 1; zidx &lt;= 99; zidx++) QIND[zidx] = getBoolVal(subStr(s.getQi</pre>
when *inO3 = *on or zerror <> *on;	retParms.zmsgidx = zmsgidx; return;
select;	)
when *inO3 = *on;	<pre>private void zputpgmdta(MSGOBJ zmessages[], for (zidx = 1; zidx &lt;= 99; zidx++)</pre>
<pre>other; znxtpgrn = 00203; znxtpgm = 'TSALEFR'; zputwrkflds(); zputpgmdta(zmessages:zmsgidx:zstatevar); return; ends1;</pre>	<pre>s.setQin(replaceStr(s.getQin(), zidx, evalCorr(zstatevar, s); retParms.zmsgidx = zmsgidx; return; }</pre>

# **Appendix G – Troubleshooting**

It is recommended that after the X-Analysis Client installation/upgrade, the first invocation should be done using the 'Clean start Eclipse' shortcut from the X-Analysis program group. The subsequent X-Analysis sessions can be started using the 'X-Analysis for Eclipse' shortcut.

# X-ANALYSIS PERSPECTIVE NOT VISIBLE/WORKING AFTER UPGRADING X-ANALYSIS CLIENT

Close the X-Analysis Perspective and exit from Eclipse/WDSc/RDi/RBD. Select **Clean start Eclipse** for X-Analysis invocation.

In case of Windows Vista and above, you may need to select the **Run as administrator** option.

Opt for the context menu on the **Clean start Eclipse/X-Analysis for Eclipse** shortcut (from the X-Analysis program group), and then select the **Run as administrator** option as shown in the screen below:



## Context Menu for Run as administrator

This will launch Eclipse correctly and you will be able to switch to the X-Analysis Perspective.

# X-ANALYSIS MENU ON THE MAIN MENU BAR DISAPPEARS FROM X-ANALYSIS PERSPECTIVE

Sometimes, it so happens that the X-Analysis menu on the main menu bar disappears. Use the **Window->Reset Perspective** option to restore it.

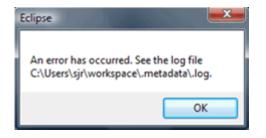
Reset Perspective	<
2 Do you want to reset the current X-Analysis perspective to its defaults?	
OK Cancel	)

Also, Eclipse allows you to drag and drop various views. If some of the X-Analysis views are accidentally closed or are not visible, the **Window->Reset Perspective** option should be used to restore them.

# **ERROR IN RUNNING X-ANALYSIS INSTALLED ON WINDOWS VISTA FOR** THE FIRST TIME

This is observed when:

- The user has installed XARuntimeEnv11_x_x.msi
- On running X-Analysis, the following error message is reported:



Check the XAPlugin.log file (available under **X-Analysis > Open Log folder**), to see if it has the following line: "java.lang.UnsatisfiedLinkError: no swt-win32-3232 in java.library.path." This means that swt-win32-3232 file is not copied to the system folder.

The reason is that UAC (User Account Control, the security feature in Windows Vista) is ON and does not allow the user to write in the system folders e.g. C:\Program Files, C:\Windows etc.

To correct this, opt for the context menu on the **Clean start Eclipse/X-Analysis for Eclipse** shortcut and select the **Run as administrator** option. Refer to the description of the option given above.

## **INITIALIZATION REPORTS**

After initializing an IBM i application various log reports are generated by the X-Analysis server. The log reports generated are categorized as:

- Program Reference Exclusions
- Missing Object and Source

## **Program Reference Exclusions**

These exclusions are specified in the **XAOBJ/XPGREXCS** file.

X-Analysis is shipped with **XPGREXCS** file containing values QRN*, QLE*, QC*, QM*, QS*. The file is duplicated into the user's X-Analysis library.

Any program reference specified in this file is excluded from the X-Analysis program crossreference database, **X@XPGRF**.

Two reports are produced to list all actual exclusions:

- **XARRMIVN** program reports on exclusions from the DSPPGMREF output
- X@PMX1 program lists exclusions from the QBNLPGMI output

## **Missing Object and Source**

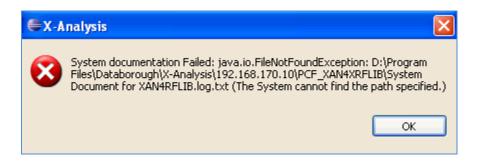
Various programs in X-Analysis initialization process write mismatches to all logs. These mismatches are printed out under the following headings:

- References to Objects not loaded
- References to Sources not loaded
- Source Code without Objects

The above reports help you to interpret the outcome of the initialization command run on an IBM i application.

## SYSTEM DOCUMENTATION FAILED: FILENOTFOUNDEXCEPTION

On executing the X-Analysis Documenter, if the following error is reported:



This means that the user does not have rights to create files under Program Files folder.

Do the following to get around this problem:

- 1. On WDSc, under the X-Analysis menu, opt for **Change Application Folder**. Select the folder for which you have full rights.
- 2. Opt for the **Documenter** again.

## SWTEXCEPTION ON WINDOWS 2000 MACHINES

If the following error is reported on opting for diagrams in X-Analysis running under Windows 2000 machine:



This can be corrected as follows:

This is the SWTException that is reported on the Windows 2000 machines. The cause for this exception is the absence of GDI+ library (gdiplus.dll) on Windows 2000. On Windows XP and Vista, it is available by default. The user needs to download the required DLL (gdiplus.dll) from Microsoft site.

http://www.microsoft.com/downloads/details.aspx?FamilyID=6a63ab9c-df12-4d41-933c-be590feaa05a&DisplayLang=en

Download and copy the GDIPLUS.DLL to the default installation directory e.g. C:\PROGRAM FILES\DATABOROUGH\ECLIPSE\JRE\BIN

Restart X-Analysis and the diagrams should show up now.

# SCREEN/REPORT DESIGN FEATURE FAILS WITH SERVER JOB ERROR

If the **Screen/Report Design** feature was working fine earlier and is now giving error, then look at the Server Job associated with X-Analysis.

1. Identify the QZDASOINIT job associated with the XA session and look for the USER NAME/QPRTJOB messages. For example:

Message . . . . : A duplicate job named 103581/MARK/QPRTJOB was found. Message . . . . : A duplicate job named 161482/MARK/QPRTJOB was found.

- Run the following command on the session: WRKSPLF SELECT(*ALL) JOB(103581/MARK/QPRTJOB) and WRKSPLF SELECT(*ALL) JOB(161482/MARK/QPRTJOB). Take **Option 4** against the spool files to delete them.
- 3. Opt for the Screen/Report Design feature again. This should be working now.

# **X-ANALYSIS DIAGNOSTICS UTILITY**

### Note: To ensure correct results, please use the 'Run as administrator' option for this utility.

The X-Analysis Diagnostics utility is invoked automatically when an exception occurs on X-Analysis; it opens the log folder which has the "XADiagnostics.log" along with other '.log' files. This utility will log entries under CLSID value (for bean), databorough\lib folder structure and information about IBM's Rational products 7.5 and above or Eclipse 3.4 and above.

This utility can also be invoked standalone to provide directory and registry structure related to the X-Analysis installation to a log file. To run this utility, select the **X-Analysis Diagnostics** under the X-Analysis program group:

🗊 XA Diagnostics	
When you press Start button, this will scan your X-Analysis folder and dump the Directory and Registry structure to "XADiagnostics.log" file.	Start Cancel
<	>

## X-Analysis Diagnostics utility dialog

# **ERROR MESSAGE APPEARS ON SIGNON TO X-ANALYSIS**

While signing on to X-Analysis if the following error message is displayed, then please perform the following troubleshooting steps:

<b>F</b>	-1:-1	
Error	ala	log

Error - Ja	ava 🛛 📉
	java.lang.UnsatisfiedLinkError: getBrowserProxySettings
	<u>L</u> ess Details
	java.lang.UnsatisfiedLinkError: getBrowserProxySettings
	at sun.plugin.net.proxy.WIExplorerProxyConfig.getBrowserProxyS
	at sun.plugin.net.proxy.WIExplorerProxyConfig.getBrowserProxyIn at sun.plugin.net.proxy.PluginProxyManager.reset(Unknown Sour
	at sun.plugin.net.proxy.rhuginrioxy.manager.reset(Onknown Source)
	at sun.plugin.AppletViewer.initEnvironment(Unknown Source)
	ок

1. Go to the Control Panel.

Double-click the Java Plugin. This opens the Java Plug-in Control Panel. Go to **Proxies** Panel. The Proxies panel looks like this:

Java Plug-in Cont	rol Panel

Protocol	Address	Port
HTTP Secure		
TP		
Bopher		
Bocks		
No Proxy Host (Use comma to s Automatic Proxy Configuration U		

Uncheck the Use Browser Settings checkbox. Click Apply and close the Java Plug-in Control Panel.

2. Start XA again.

## DATA FLOW DIAGRAMS ARE UNAVAILABLE

Sometimes the available version of the Graphical Editor Framework may not be compatible with what is required for the new feature. Perform the following steps to begin viewing the Data Flow Diagrams:

1. On the WDSc, go to **Help** and select **Software Updates**. This will display the list of the installed plugins (as shown below). Look for the Graphical Editor Framework and cross-check the version number. The following image shows the **Software Updates and Add-ons** window

Software Updates and Add-ons					
Installed Software Available Software					
Name	Version ^	Update			
🖗 EMF Edit UI	2.4.0.v200806091234	11.2.4.0			
🖗 EMF Mapping	2.4.0.v200806091234	Uninstall			
🖗 EMF Mapping UI	2.4.0.v200806091234				
🖗 EMF Model Converter	2.4.0.v200806091234	Descrition			
🕸 EMF Sample Ecore Editor	2.4.0.v200806091234	Properties			
REMF SDO - Service Data Objects Runtime	2.4.0.v200806091234				
🖗 Graphical Editing Framework Draw2d	3.4.0.v20080115-33-7w3119163_	Revert Configuration			
🖗 Graphical Editing Framework GEF	3.4.0.v20080115-677-8082A5696H274A	Reven Configuration			
🖗 Java EE Developer Tools	3.0.0.v200806111800-7U-8Y9LIrwYBUV7sH				
🖗 Java Persistence API Tools	2.0.0.v200806090000-7938aCYQCD4CmHł				
🖗 Java Persistence API Tools - EclipseLink Support (	2.0.0.v200806090000-38s733I3D683333				
🖗 JavaScript Developer Tools	1.0.0.v200806092130-6BcMAAwAbQRLC				
🖗 JST Common Core	3.0.0.v200806092130-25-8s733I3C4G6D37				
🖗 JST Enterprise Core	3.0.0.v200806092130-42E9w_kE77c7S9O_JE				
🖗 JST Enterprise UI	3.0.0.v200806092130-7Y7BFSHEPOwQKwk				
lST Enterprise User Documentation	3.0.0.v200712031330-52EAUAgl99m9YDcF 🗸				
<	>				
pen the <u>'Automatic Updates'</u> preference page to set up a	an automatic update schedule.	Close			

#### List of installed plugins

If the GEF version number on the user's RDi is below 3.3, the **Data Flow Diagram** will not be displayed. In such a scenario, perform the following steps to update the Graphical Editing Framework:

2. Click on the **Available Software** tab and check for the latest version of the Graphical Editing Framework.



Available	Software	window
-----------	----------	--------

Software Updates and Add-ons		- 🗆 ×
Installed Software Available Software		
type filter text	~	Install
Name	/ersion	
Image: style="text-align: center;">		Properties
		Add Site
		Manage Sites
		Refresh
<	>	
Show only the latest versions of available software		
✓ Include items that have already been installed		
Open the <u>'Automatic Updates</u> ' preference page to set up an automatic update schedule.		
0		Close

If the installed GEF software is below 3.3, its upgraded version will be shown in the list of available software. Click the relevant box to install the latest version.

If the latest version of the software is not displayed, click on **Add Site**. The following window will be displayed:

	Add Site dialog	
•	Add Site	×
Location: [	http:// Archive	
0	OK Cancel	

3. Provide the name of the given site in the Location field:

http://archive.eclipse.org/tools/gef/downloads/drops/R-3.3-200706281000/

- 4. Click OK.
- 5. Close the Software Updates and Add-ons window and re-start the WDSc to view the DFDs.

Note: Verify the current location of the installed X-Analysis. If it is installed on the XA Runtime Environment, you must uninstall the X-Analysis client as well as the XA Runtime. Re-install X-Analysis to resume its working on the WDSc.

# **SETTING THE PASSWORD FIELD**

To set the password field for more than 10 characters, please perform the given steps:

- 1. Go to Window->Preferences->X-Analysis.
- 2. Check the **Case-sensitive or greater than 10 character Password** setting and click **OK**. The setting is shown below:

\$	Preferences	_ 🗆 🗙
type filter text	X-Analysis	⇔ • ⇔ • •
General Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis XDoclet XML	General X-Analysis Preferences.  IP Address 192.168.21.102 User Case-sensitive or greater than 10 character Password Offline Mode Specify the DB2 port number in order to access offline X-Analy DB2 Port 50000 Begin with Outline Detailed DFD by default Show Re-engineered Screen for Screen/Report layout.  Ignore Linked Repositories (if any)  Open Called Procedure/Program source in same tab Open Data Flow Diagram in same tab Open Data Flow Diagram in same tab Ouse Source buffering Allow editing in Consolidated Rules Show only Objects in Metrics Restore Defa	✓
0	ОК	Cancel

X-Analysis Preferences – Modifying the password setting

3. Login again. You will be able to input more than ten characters for the password.

# **ERROR IN GENERATING PROGRAM DOCUMENTATION**

There may be instances (while generating program documentation) when you may encounter the following error:

# Information window showing error in MS Word initialization

Export to MS Word	×
Error in initializing Microsoft Word. Please ensure that it is installed correctly.	ОК

To resolve this error, check the preference setting for documentation.

Go to **Window->Preferences->X-Analysis->Advanced** tab. You will see a specific setting **Use MS Word OLE Automation** under **Document Generation**. Check the box to activate the OLE automation for various documenting and exporting tasks.

<b>e</b>	Preferences	- • ×
type filter text	Advanced	⇔∗⇔∗∗
General Ant	Advance Setting Preferences.	
Ant Data Management Help Install/Update Java JavaScript JPA Plug-in Development Remote Systems Run/Debug Server Service Policies Tasks Team Usage Data Collector Validation Web Web Services X-Analysis Folders General X-Data Test	<ul> <li>Work with Objects <ul> <li>Default File Attribute</li> <li>Default Frigram Attribute</li> </ul> </li> <li>Subset Data <ul> <li>Include Owners</li> <li>Include All Dependents</li> <li>Replicate Triggers/Constraints</li> <li>Data Option</li> </ul> </li> <li>Search Settings <ul> <li>Occurrence</li> <li>UML Diagram <ul> <li>Show object name in Class diagram</li> </ul> </li> <li>Pocument Generation <ul> <li>Use MS Word OLE Automation</li> <li>Diagram Export <ul> <li>Use Open Office Draw for 64-Bit</li> <li>Synon Data Flow Diagram</li> </ul> </li> </ul></li></ul></li></ul>	PF v *ALL v *VES v *NO v *REPLACE v
X-Redo XDoclet XML	Use old logic for Synon DFD Database Language Translation No	Translation requirec V Defaults Apply
0	ОК	Cancel

### Advanced Preferences window – Document Generation

If OLE automation fails, check your OS configuration. For instance, if you have a 64-bit OS, the OLE automation will not work. In such a case, uncheck the **Use MS Word OLE Automation** to continue generating documents in generic format. These documents can be viewed later using MS Office or Open Office.

# **USING THE FRENCH INTERFACE**

If you wish to run the Eclipse provided with the Runtime Environment in the **French** mode, you need to edit the properties of the shortcuts provided in X-Analysis group – **Clean start Eclipse** and **X-Analysis for Eclipse**.

Using the **Properties** option on the shortcuts, update the **Target** value by appending ' **-nl fr_FR**' at the end of existing value.

**Clean start Eclipse – Properties dialog** 

Clean start Ecli	pse Properties 🛛 🛛 🔀
General Shortcu	ut Compatibility Security
	ean start Eclipse
Target type:	Application
Target location:	eclipse
Target:	itaborough\eclipse\eclipse.exe'' -clean -nl fr_FR
Start in:	"D:\Program Files\Databorough\Eclipse"
Shortcut key:	None
Run:	Normal window
Comment:	Cleans cached-data and launches Eclipse. Use t
Find	Target Change Icon Advanced
	OK Cancel Apply

In case there is any other problem not covered above, please send your requests to <u>Support@freschelegacy.com</u> along with the log file for the current X-Analysis session. The file can be obtained by using X-Analysis -> Open Log Folder menu option.

# **Appendix H – Refresh X-Analysis**

X-Analysis provides two commands for the operational maintenance of X-Analysis repository (cross-reference library). These two commands are **XREFRESH** and **XAXREF**.

# **XREFRESH**

The **XREFRESH** command refreshes the cross-reference library to reflect any changes that are made to the cross-reference library. The command refreshes both the sources and objects that are already initialized; it will not look at freshly-added sources or objects.

It is recommended to run this command each night so that the cross-reference reflects the most updated state.

Before using the **XREFRESH** command ensure the following sequence of the library list:

- XAOBJ
- QGPL
- QTEMP

Then, type the **XREFRESH** command on the command line and press **ENTER**. The following screen should appear:

### **XREFRESH command screen**

Refresh Changed Objects (XREFRESH) Type choices, press Enter. X-Analysis Library . . . . . . Name Refresh Application Areas . . . *YES *YES, *NO, Y, N Refresh Business Rules . . . . *NO *YES, *NO Enter State Sta LEGACY

Provide the name of the cross-reference library which needs to be refreshed along with other details and click **ENTER** to submit a batch job. This batch job refreshes the cross-reference library.

Once the batch job is over, you can check the error log. It is a spool file generated as a result of this batch job. The following screen displays the spool file listing:

			Spo	ool file list	ing		
		Wor	k with Job S	pooled F	iles		
Job:	XREFRESH	User:	US	Num	ber:	086439	
1=S				-	-	=Release	7=Messages
Opt	File	Device or Oueue	User Data	Status		Current Page	
_	XREPORT	QPRINT QEZJOBLOG	XARPTRLOG	RDY	1	-	1 1
Param	neters for o	ptions 1, 2,	3 or comman	d			Bottom
===>	zi+ ⊑10-\\i	ON 3 E11-V	iow 2 F12-	Cancol	F22-Dr	intore	F24=More keys

Then, use **Option 5** against spool files to view the report.

### Spool file for the XREFRESH command

Display Spooled File XREPORT Page/Line File . . . . . : 1/1 Control . . . . Columns 1 - 78 Find . . . . . . *...+....1....+....2....+....3...+....4....+....5....+....6....+....7...+... X-Analysis Audit Log for X4SRCXC XREFRESH Processing XARPTRLOG XREFRESH completed X4SRCXC at 08.50.56 on 2012-12-10 * * * * E N D O F REPORT * * * *



F3=Exit	F12=Cancel	F19=Left	F20=Right	F24=More keys	
Overprint	ing not disp	layed.			

#### Bottom

# XAXREF

The **XAXREF** command reinitializes the cross-reference library to reflect any changes that have been made to the cross-reference library.

It is recommended to run this command each night (or weekly, as the case may be) so that the cross-reference reflects the most updated state.

Before using the **XAXREF** command ensure the following sequence of the library list:

- XAOBJ
- QGPL
- QTEMP

Then type the **XAXREF** command on the command line and press **ENTER**. The following screen should appear:

```
      XAXREF command screen

      Initialise X-Analysis/4 (XAXREF)

      Type choices, press Enter.
      X-Analysis Library . . . . . . ABCD
      Name

      Solution
      Name
      Bottom

      F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
      F13=How to use this display

      F24=More keys
      Parameter XRFLIB required.
```

Provide the name of the cross-reference library and press **ENTER** to input further details:



## XAXREF command screen

Initialise X-Analys:	.s/4 (XAXREF)
Type choices, press Enter.	
X-Analysis Library > ABCD	Name
Object Libraries *SPECIF: + for more values	ED Name, *SPECIFIED
Source Libraries *SPECIF: + for more values	ED Name, *SPECIFIED, *NONE
Index Source Files *CHG	*CHG, *NO, *ALL, *UPG
Build Data Model *NO	*YES, *NO
Generate Business Rules *NO	*YES, *NO
Initialise X-Resize *NO	*YES, *NO
Include obsolete source/object *NO	*YES, *NO

If the sources and objects are modified, then the **XAXREF** job needs to run with *CHG option and Build Data model to ***YES** (to track any file level changes in keys, fields etc.), Generate Business Rules to ***YES** (to track any source level changes).

The details of the various options available on the **XAXREF** command are given below:

Feature	Brief Description
X-Analysis Library	The X-Analysis cross-reference library name.
Object Libraries	Special value *SPECIFIED is selected by default. It means that X-Analysis will retrieve all object libraries you have previously specified (using <b>Option 8</b> ).
Source Libraries	Special value *SPECIFIED is selected by default. It means that X-Analysis will retrieve all source libraries you have previously specified (using <b>Option 8</b> ).
Index Source Files	Specify whether or not to create indexes over the source files. These indexes will allow the immediate display of "where used" data. They may be required for the data model generation, depending on which options are taken. If the indexes are not built now, they can be built for an individual Source Member at the time they are viewed through the X-Analysis browser. Select one of the following:
	<ul> <li>*CHG – Only update current indexes. It will find newly added source members and remove deleted members. It will also index any source member that has changed since the last initialisation.</li> </ul>
	• *NO – Do not build the indexes
	<ul> <li>*ALL – It is similar to *CHG when it comes to finding new members and removed members. It will index all source members without checking the change date.</li> </ul>
	<ul> <li>*UPG – Upgrade the X-Analysis database and rebuild all data including all indexes (replacing current ones).</li> </ul>
Build Data Model	If you take the option to build the data model for your application then you can view it through X-Analysis. Select one of the following:
	• *YES – Build the data model
	• *NO – Do not build the data model
	You should have the X-Analysis Professional Module/Modeling set for this to work.

Feature	Brief Description
Generate Business Rules	If you take the option to generate the business rules for your application then you can view it through X-Analysis. Select one of the following:
	• *YES – Generate Business Rules
	*NO – Do not generate Business Rules
	You should have the X-Rules Module/Design Recovery set for this to work. If choosing *YES, Modeling should have been already performed or Build Data Model should be *YES.
Initialize X-Resize	If you take the option to generate the X-Resize Project for your application then you can view it through X-Analysis. Select one of the following:
	*YES – Initialise X-Resize Project
	<ul> <li>*NO – Do not initialise X-Resize Project</li> </ul>
	You should have the X-Field Resize Module for this to work.

Press **ENTER** to submit a batch job to process the **XAXREF** command.

Once the batch job is over, you can check the different log files, which are spool files generated as a result of this batch job. Different sets of spool files are generated based on RPG or 2E environment.

For RPG environment, the following spool files are generated:

Spool File	Message	Purpose
XREPORT	Audit Log for <x-ref library=""> Init</x-ref>	Job Initialisation
XREPORT	Audit Log for <x-ref library=""> D/B Model Build</x-ref>	If Build Data Model is *YES
XREPORT	Audit Log for <x-ref library=""> Business Rule Extraction</x-ref>	If Generate Business Rules is *YES

For 2E environment, the following spool files are generated:

Spool File	Message	Purpose
XREPORT	Audit Report for <x-ref library=""> Load on</x-ref>	Object/Member List
XREPORT	Audit Log for <x-ref library=""> Init</x-ref>	Job Initialisation
XBREPORT	SYNON Relationships where foreign keys are missing	Foreign key relationships
XREPORT	Audit Log for <x-ref library=""> D/B Model Build</x-ref>	If Build Data Model is *YES
XREPORT	Audit Log for <x-ref library=""> Re-engineering Processing</x-ref>	Re-engineering executed
XREPORT	Audit Log for <x-ref library=""> Business Rule Extraction</x-ref>	If Generate Business Rules is *YES

Use the following command to check the generated spool file:

# WRKJOB JOB(JOB NUMBER/USER/XAXREF)

This should invoke the following similar screen:



## Work with Job screen

		Wo	ork with Job		
Job:	QPADEV0021	User: US	Number:	System: 087868	DBSPW6
Select	one of the fol	lowing:			
2 3	. Display job s . Display job d . Display job r . Work with spo	efinition att un attributes	tributes		
11 12 13 14 15	<ul> <li>Display call</li> <li>Work with loc</li> <li>Display libra</li> <li>Display open</li> <li>Display file</li> </ul>	stack, if active ks, if active ry list, if a files, if act overrides, if	e active tive	pending	
Select: ===>	ion or command				More
F3=Exit	t F4=Prompt	F9=Retrieve	F12=Cancel		

Then, use **Option 4** to work with associated spool files:

# Job-specific Spool Files

		Wor	k with Job S	pooled F	iles		
Job:	XAXREF	User:	US	Num	ber:	087868	
1=	options, pr Send 2=Cha Attributes		4=Delete with printi	-	-	6=Release	7=Messages
		Device or			Total	Current	
Opt	File	Queue	User Data	Status	Pages	Page	Copies
	XREPORT	QPRINT	XARPTRLOG	RDY	1		1
	XREPORT	QPRINT	XARPTRLOG	RDY	1		1
	XREPORT	QPRINT	XARPTRLOG	RDY	1		1
	QPJOBLOG	QEZJOBLOG	XAXREF	RDY	90		1

Then, use **Option 5** against spool files to view the report.

# Appendix I – X-Analysis Indexes Job Scheduler Entries

X-Analysis initialization process (**XA4INIT** command) calls the **XASCDEIDX** and **XAROBOT** commands towards the end of the processing. These commands generate source members for IBM Job Scheduler entries and ROBOT Job Scheduler entries.

X-Analysis initialization process starts the ROBOT processing if it finds the **RBTROB8**, **RBTCMD1** and **RBTCS2** files all in the same library.

For ROBOT entries, it creates and indexes source members in QCLSRC and writes XMEMBER records. It also populates the **XAROBOTIDX** file.

# **XASCDEIDX COMMAND**

The **XASCDEIDX** command will cross reference the IBM job scheduler entries. A CL source member is generated in the specified library for each job.

This source is then indexed, enabling references to be displayed through the Variable Where Used and the Object Where Used features.

### X-Ref Job Scheduler Entries (XASCDEIDX)

X-Ref Job Scheduler Entries (XASCDEIDX) Type choices, press Enter. X-Analysis library . . . . . . Name CL source library . . . . . . Name

# **X-Analysis Library**

Enter the name of the X-Analysis library where the Where Used data should be stored.

# **CL Source Library**

Enter the name of the library where the CL source should be stored. This can be the X-Analysis library itself, if required.

# **XAROBOT COMMAND**

The **XAROBOT** command creates Program References and Global Where Used entries for jobs initiated from the Robot job scheduler.

### Index Robot Scheduler Jobs (XAROBOT)

Create/Index Robot Sched Jobs (XAROBOT)

Type choices, press Enter.

X-Analysis library . . . . . . Name Robot library . . . . . . . Name CL source library . . . . . . Name

# X-Analysis Library

Enter the name of the X-Analysis cross-reference library built for the application containing the jobs scheduled by Robot.

# **Robot Library**

Enter the library name that contains the Robot database.

# **CL Source Library**

Enter the library name where the program can generate CL source members for each scheduled job entry. You can enter **QTEMP** if you do not wish to keep or view the source programs generated.

# **Appendix J – Dual Installation of X-Analysis**

X-Analysis gets installed on the X-Analysis Runtime Environment if both RDP and Runtime Environment are installed (as preference is given to the Runtime Environment).

In order to run X-Analysis on both the Runtime Environment and RDP 8.5, you must follow the steps given below:

- 1. Uninstall X-Analysis, which is installed on RDP, and then install X-Analysis Runtime Environment.
- 2. Install the X-Analysis client.
- 3. In the location where Runtime Environment is installed (for e.g. C:\Program Files\Databorough\Eclipse) look for a subfolder named dropins. This would have a file named com.databorough.xanalysis.plugin.link
- 4. Now locate the installation path for RDP. At the same level where eclipse.exe lies (like C:\Program Files\IBM\SDP), look for the dropins folder, or create one if it does not exist. Copy the file as in 3 above to this dropins folder.
- 5. Copy a shortcut to RDP to desktop. Right-click the shortcut, and select **Properties**. At the end of the 'Target' text box, append –clean.
- 6. Start RDP using the new shortcut. X-Analysis should be visible as one of the perspectives.

The UML plugin cannot be installed from within Rational 8.5, as the underlying Eclipse Modelling Framework required for these plugins does not match those which Rational has inbuilt. The new version of EMF no longer supports the UML2Tools plugins that are supplied with our UML Support msi.

# LEGACY

# **Appendix K – Use SSL feature**

The X-Analysis **Sign-on** dialog is equipped with the 'Use SSL' feature. The feature has been introduced to transfer data in a secure manner. The box is unchecked by default. Check the box to enable the feature while working with X-Analysis.

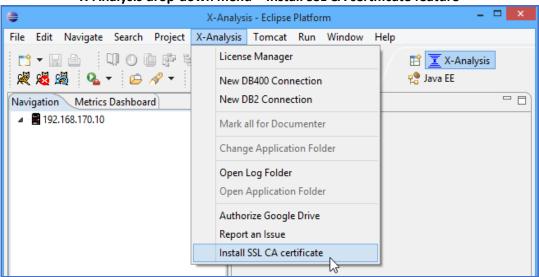
The following screenshot shows the dialog:

٠	Sign-on	to X-Analysis 📃	×
	Host Name	192.168.21.102	
₹	Username	SKHAN	
1	Password	•••••	
	Use SSL		
	Login	Cancel	

X-Analysis – Sign-on dialog

Before using this feature, follow the given steps to establish the SSL connection:

1. Choose the X-Analysis drop-down menu from the X-Analysis toolbar and click on the **Install SSL CA certificate** feature. The selection is shown below:



X-Analysis drop-down menu – Install SSL CA certificate feature

2. Click Install SSL CA certificate to invoke the Install CA Certificates dialog (as shown below).

	install CA Certificates ulalog	
Install CA Certificat	es	X
Alias Name	Last Modified	Open
		Import
		Details

Install CA Certificates dialog

3. Click **Open** to invoke the **Open CA Certs Keystore** dialog with **cacerts** file. Select it and click **Open**.

	Ор	en CA Certs K	eystore dia	log	
Open CA Certs	Keystore				? 🔀
Look in:	🚞 security		~	G 🦻 🖻 🗄	
My Recent Documents	acerts				
My Documents					
My Computer					
Wy Network	File name: Files of type:	cacerts		¥	Open Cancel

LEGACY

4. A new dialog is displayed which prompts you to enter the password for Keystore. The default password is 'changeit'.

🖨 Install CA Cert	ificates	×
Alias Name	Last Modified	Open
	Password for Keystor 🗙	Import
	Enter Password: Cancel	

Password for Keystore dialog

5. Click **OK**. The **Install CA Certificates** dialog displays the list of all the available certificates.

dified 006:06:20:24 006:06:21:44	Open
006:06:21:44	
006:06:23:29 008:09:41:21 008:01:00:28 002:05:35:16 002:05:58:14 008:11:02:12 008:11:14:52 008:11:02:50 009:09:37:38	Details
	2009:09:38:19 2009:01:01:21

6. Click **Import**, and select the Security Certificate issued from the iSeries. It would then get added to the list of certificates, providing you with the necessary authorization.

After performing these steps, check the 'Use SSL' box in the **Sign-on** dialog to begin using the feature.

LEGACY

# **Appendix L – Setting Status for Business Rules**

# **BUSINESS RULES STATUS***

When you select the Business Rules Overlay or the Business Rules mode in the Source Editor, a new functionality allows you to set Rule Status for any rule.

*Check the box – 'Allow editing in Consolidated Rules' from Window->Preferences->X-Analysis for full activation of these features.

You can set comment and/or change the rule status for any rule. Select the right-click option, Change Rule Status to, for directly changing the rule status.

A list of such possible statuses is already provided, and shown in the image below:

			;	💩 🏋 = 🏹 🔐 = 27 💩	<b>III</b> * III <del>I</del>			
Business Rules for CUSFMAINT, Number of Lines: 10								
Source Member	Rule Number	Field	File	Rule	Message ID			
CUSFMAINT CUSFMAINT CUSI No Status CUSI Applicable No CUSI Complete CUSI QA Done CUSI Awaiting fea CUSI Assigned Not applicabl Covered by I Not Applicabl In Process QA Waiting Production Unit Tested		erified	CUSF CUSF CUSF	Cus: No pot found on Sites Annotate Rule Status Manager Change Rule Status to Matched Rules Variable Where Used Convert to Exportable Show Hierarchy	OEM0012 (You r OEM0014 (The t OEM0015 (The f OEM0018 (The c OEM0019 (The s OEM0020 (You r OEM0021 (The t			

**Business Rules window – List of Rule Status** 

View the history of how the rule status has changed through the Rule Status Manager option available on right-click on a rule. The following image shows the Rule Status Manager dialog.



### Rule Status Manager dialog

🛡 Rule Stat	us Manage	r			X			
Rule Status Comment								
BR added programmatically for rule# 4								
Rule Status Hi	istory							
Previous St	Current St	User	Date	Time				
А	С	DVERMA	2014-02	06:13:14				
Change Rule S	Status							
Complete - C					~			
QA Done - D Awaiting feature	) - F				^			
Assigned - G	, I							
Not applicable -								
Covered by Meta	adata Not Verifie	<u>ed - M</u>			×			

The Business Rules view displays new columns for Error Message, Business Rule Annotation, Rule Status, and Rule Status Comment. The columns are shown in the image underneath.

Business Rules window showing the new columns						
📴 Business Rules 🛛	+ 💦 🎪	📆 🌾 🍸 🖨 🗵 🕶 🚺	] - 📪 🗆 🗆			
Business Rules for CUSFMAINT, Number of Lines: 10						
Message ID	Rule Status	Rule Status Comment	Annotation			
	No Status					
OEM0012 (You must enter the customer name.)	No Status					
OEM0014 (The telephone no. is invalid.)	No Status					
OEM0015 (The fax. no. is invalid.)	No Status					
	No Status					
OEM0018 (The distributor is invalid.)	No Status					
OEM0019 (The status is invalid.)	No Status					
OEM0020 (You must enter a contact name.)	No Status					
OEM0021 (The title is invalid.)	No Status					
	No Status					
			>			

The **Configure Columns** feature in the Business Rules view allows the user to manage the columns displayed. The user can reduce the width, or hide any column by setting width to 0.



	Busine	ess Rules	window	– Configure	e Columns option	
🛃 Business Rules	×				💩 🏷 • 🐧 🍞 🖨 🗵 • 🚺	
Business Rules for C	USEMAINT, Numb	per of Lines: 1	0		🛢 Configure Col 🔳 🗖 🔀	
Source Member	Rule Number	Field	File	Rule		
CUSEMAINT CUSEMAINT CUSEMAINT	00001 00002 00003	CUSNO CNAME TELNO	CUSF CUSF CUSF	Cus_No not for Company = bla Phone <> blar	Rule Number Field	u must ent e telephor
CUSFMAINT CUSFMAINT CUSFMAINT	00004 00005 00006	FAXNO DSDCDE DSDCDE	CUSF CUSF CUSF	Fax_No <> bla Distributor <> Exact match no	Rule Message ID	e fax, no, e distribut
Cusemaint Cusemaint Cusemaint	00007 00008 00009	STATUS USERNM SALUT	CUSF CUSF CUSF	Sts <> blank Contact = blan Salutation <>	Rule Status Rule Status Comment Annotation	e status is u must en e title is in
CUSFMAINT	00010	CUSNO	CUSF	Customer = 0		
					Width of selected column: 100	
					OK Cancel	
<						

in the Dullace situation of the . **c**: . .... . . . . . .

There are various buttons for filtering business rules display. The rules are filtered based on whether they are Exportable Rules, Update Rules, or Excluded Rules. The filters have toggle behaviour. The following image shows the three filter buttons.

<b>Business</b>	Rules	window	– Filter	buttons
-----------------	-------	--------	----------	---------

🛃 Business Rules 🛛		· 💦 💩	• 🚡 🐔 🖉 • 🔳 • 🗮 🗖 🗖
Business Rules for CUSEMAINT, Number	er of Lines: 10		
Source Member Rule Number	Field	File	Rule
CUSFMAINT 00001	CUSNO	CUSE	Cus_No not found on Sites
CUSFMAINT 00002	CNAME	CUSE	Company = blank

An additional option, Filter by Rule Status has been provided to filter the rules based on their status. Make the selection from the list of Rule Status in a drop-down menu.

Business Rules window – Filter I	by Rule Status Option
🛱 Business Rules 🛛 🛛 💰	🛐 🚡 🚡 🖌 🖨 🖉 ד 🚺 ד
<ul> <li>Show All</li> <li>No Status</li> <li>Applicable Not able to be generated Not assigned</li> <li>Complete</li> <li>QA Done</li> <li>Awaiting feature</li> <li>Assigned</li> <li>Not applicable</li> <li>Covered by Metadata Not Verified</li> <li>Not Applicable for Endeavor</li> <li>In Process</li> <li>QA Waiting</li> <li>Production</li> <li>Unit Tested</li> <li>Generated By X-Analysis Not Verified</li> </ul>	Rule         Cus_No not found on Sites         Company = blank         Phone <> blank         Fax_No <> blank         Distributor <> blank         Exact match not found for Distributor         Sts <> blank         Contact = blank         Salutation <> blank and <> 'Mr' and         Customer = 0

Business Rules window – Filter by Rule Status option

There is an option to allow to **Add User defined Rule**. Select the relevant File/Field and set the Rule text and error message ID. Such rules start from 60001, and are shown in a different color (orange). Select the option to invoke the following dialog:

🛃 Business Rules 🛛		s • 👖 • 🖬 • 🖬 • 🖬 •
🖨 Add User Defined	Rule	Rule
Source Member 205F	MAINT	Cus_No not found on Sites Company = blank Phone <> blank Fax_No <> blank
File CUSF	✓	Distributor <> blank Exact match not found for Distributor
Field ADD1	<b>∨</b>	Sts <> blank Contact = blank Salutation <> blank and <> 'Mr' and
Rule		Customer = 0
Message ID		
	OK Cancel	
<		>

Add User Defined Rule dialog

LEGACY

Note: Define a rule only when you have selected the 'Business Rules' feature on an individual program from the Source Member view.

Select the right-click option to convert a rule to 'Exportable/Non Exportable'. The option is displayed in the image below:

🛃 Business Rules	×		• 🎢 💩	• 🚡 🐔 🕈 🖨 🗵 • 🚺 • 📑 🗖 🗖
Business Rules for Cl				
Source Member	Rule Number	Field	File	Rule
CUSFMAINT CUSFMAINT CUSFMAINT CUSFMAINT CUSFMAINT CUSFMAINT	00001 00002 00003 00004 00005 00006 00007	Annotate Rule Status M Change Rule S Matched Rule: Variable Wher	Status to 🕨	Cus_No not found on Sites Company = blank Phone <> blank Fax_No <> blank Distributor <> blank Exact match not found for Distributor Sts <> blank
CUSFMAINT CUSFMAINT CUSFMAINT	00008 00009 00010	Convert to Ex Show Hierarch		Contact = blank Salutation <> blank and <> 'Mr' and Customer = 0

Business Rules window – Convert to Exportable option
------------------------------------------------------

The X-Analysis client allows you to view the Business Rules Matching/Exclusion list, produced as a result of a process on server which compares the existing cross-reference against an older one, and moves the Business Rule Status and Annotations from the older to the new cross-reference.

This report can be seen by the right-click option, **Business Rule Matching**, available on the context menu of the entire cross-reference, an application area, or a program. The report can be filtered to view only one of the types (Changed/Removed/Matched), and also exported to Word/PDF/Excel.

The following image shows Business Rule Matching view of application area, HORIZON.

isiness Rule Mat	ching/Exclusion List	for HORIZON in FISG	LOXC			<ul> <li>Show All</li> </ul>		
Category	Member	Library	File	Field	Old Rul	Show Chan	ged Only	ext
🗉 Changed						Show Match	ned Only	
• Removed						Show Remo	oved Only	
Matched								_
	DDA400LE	FISGLOXA	SIRTPRMO	PRTCODE	2	2	Prom	otional_Rate_Code
	DDA400LE	FISGLOXA	DDRTPACT	PRTACCT	4	4	Accou	int found on DD_Pri
	DDA400LE	FISGLOXA	DDAACTT	ATCD	8	8	ACCT	_TYPE_CODE not for
	DDA400LE	FISGLOXA	DDAACTT	ATDS	9	9	ACCT	_TYPE_DESC <> b
	DD 4 400LD	FTCOLOVA	DDAACTT	ATOC	10	10	1007	THE BEAR AND

<b>BR Matching</b>	window
--------------------	--------



# **BUSINESS RULES STATUS CATEGORY**

The **Business Rules Status Category** option is present on the context menu of the X-Ref library as is seen in the image below.

Rules	s Status Category option – X-Ref con	1
	New Application Area	
	Add Alternate Data Library List	
	Reset Library List	
	Application Library List	
	Affinity Comparison	
	Refresh Options	
	Derive Business Rules	
	Business Rules Matching	
	Business Rules Status Category	
2	Import Options	
	Export Options	
	Document Entire Application	
	Document Changed Objects	
	Reengineer Programs	
	Generate Programs	
	Generate Web Services	
	Generate Data Application	
	Data Migration	
	Inter-Repository Options	
	Audit Options	

# Business Rules Status Category option – X-Ref context menu

All the pre-set categories of Business Rules Status are displayed on clicking this option. The following window shows all the categories:



🖬 Status Category 🗵					
Business Rules St	atus Category				
Category	Description				
N	Not Applicable for Endeavor				
х	Generated By X-Analysis Not Verified				
U	Unit Tested				
т	Production				
Q	QA Waiting				
Ρ	In Process				
M	Covered by Metadata Not Verified				
L	Not applicable				
G	Assigned				
F	Awaiting feature				
D	QA Done				
C	Complete				
Α	Applicable Not able to be generated Not assigned				

The existing categories can be edited or deleted by using the right-click context menu on a specific category. The following image shows the context menu opted on a category.

## Right-click context menu opted on a category

🛃 Status Category	x	🐯 🗖 🗖
Business Rules Status	Category	
Category	Description	^
Ν	Not Applicable for Endeavor	
Х	Generated By X-Analysis Not Verified	
U	Unit Tested	
T Edit	ction	
Q Delete	aiting	- 1
М	Covered by Metadata Not Verified	
L	Not applicable	
G	Assigned	~

On selecting the **Edit** option, the following dialog box is invoked:



## Work With Status Category dialog

Work	With Status Category	x
Category Description	T Production	
	OK Cancel	

Using the above dialog, modify the description of the default category, as required.

On clicking **Add Status Category** icon on the Status Category toolbar, the same dialog as presented above is invoked. This time you can assign a letter for the Category, besides the Description. The icon is indicated in the following image:

🛃 Status Catego	ry 🕱	
Business Rules Sta	tus Category	5
Category	Description	Add Status Category
N	Not Applicable for Endeavor	
Х	Generated By X-Analysis Not Verified	
U	Unit Tested	
Т	Production	
Q	QA Waiting	×

### Add Status Category icon

# **Appendix M – Export to Google Drive**

You can now export DOCX and XLSX type to Google Drive. The use of Google Drive export requires Authorization setup. As the initial step, you will need to authorize the Google Drive, and then select the related options from X-Analysis Preferences.

The link provided below helps you with all the information related to the Google Drive Web APIs:

https://developers.google.com/drive/web/quickstart/quickstart-java

The steps to be followed are given as below:

1. Generate a Client ID/Client Secret for your google account. Click on the link:

https://console.developers.google.com//start/api?id=drive&credential=client_key

The following window will appear:

🚯 Quickstart: Run a Drive Ap 🗴 🛞 Google Developers Console 🛛 🔸			×
🛞 🔒 https://accounts.google.com/ServiceLogin?service=cloudconsole&passive=true&continue=https%34%2F%2Fconsole.developers.google.cc 👻 🤁 🛛 🔍 Search	☆ 自 ↓	ŀ ↑	≡
Google			ĺ
One account. All of Google.			
Sign in to continue to Google Developers Console			
Email Password Stay signed in Need help?			
Create an account			
One Google Account for everything Google			
About Google Privacy Terms Help	English (United States)	v	

## Sign in window – Google Developers Console



Sign in with your google email id and password.

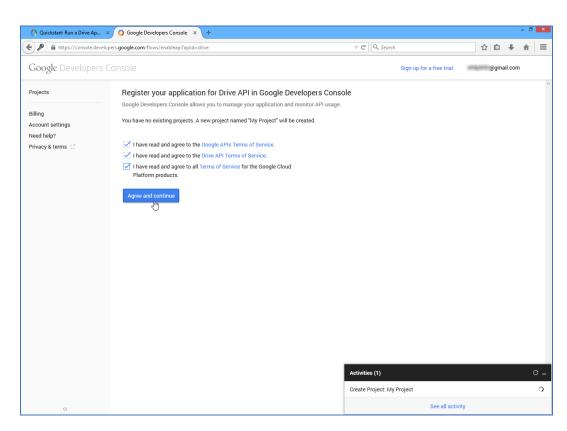
2. After sign in is complete, the following registration window will appear:

🌖 Quickstart: Run a Drive Ap	× 📀 Google Developers Co	onsole × +		×
Audektart: Run a Dirve Ap x     O Gogle Developers Console x     +     O Gogle Developers gogle.com/flows/enableapi1apiid=d     C G Gerrch     C Gogle Developers Console     Sign up for a free trial.     O gemail.com     Projects     Register your application for Drive API in Google Developers     Console     Google Developers Console allows you to manage your application and monitor API usage.     You have no existing projects. A new project named "My Project" will be created.     I have read and agree to the Google APIs Terms of Service.     I have read and agree to all Terms of Service for the Google Cloud     Platform products.     I have read and agree to all Terms of Service for the Google Cloud     Platform products.				
Google Developers			@gmail.com	
Billing Account settings Need help?	Console Google Developers Co You have no existing p I have read and ag Platform products Agree and continue Welcome to Google Clou Use the same infrastructure t	nsole allows you to manage your applications of the Google APIs Terms of Service gree to the Google APIs Terms of Service. gree to all Terms of Service for the Google.	ation and monitor API usage. ct" will be created. e Cloud	

Check the box on the pop-up and click **Continue**.

3. The following window will appear. Confirm the registration process by checking all the boxes.





Click Agree and continue. A project will be created with the default name, My Project.

4. Under **My Project > APIs & auth**, click on **APIs**. Check that the **Drive API** is **ON** as displayed in the following image:



	APIs v	window		
Google Developers Conso ×				- 🗆 🗙
	 onsole.developers.google.com/	project/electric-icon-806/ap	iui/api	☆ =
	r bookmarks here on the bookmarks bar			~ –
Google Developers (	Console	Sign up for a free tria	al. @gma	il.com
< Projects	Enabled APIs Some APIs are enabled autom	atically. You can disable them if y	ou're not using their se	rvices.
My Project	NAME ^		QUOTA	STATUS
APIs	BigQuery API		0%	ON
Credentials Consent screen	Debuglet Controller API		0%	ON
Push	Drive API			ON
Monitoring Source Code	Google Cloud SQL			ON
Compute	Google Cloud Storage			ON
Networking Storage	Google Cloud Storage JSON A	PI 🌣		ON
Big Data	Browse APIs			
Support Need help?	Filter by API name or descrip	otion		
Privacy & terms 🛛	NAME ^		QUOTA	STATUS
	Ad Exchange Buyer API		1,000 requests/day	OFF
<<	Ad Exchange Seller API		10,000 requests/day	OFF
	ALL CODY		150.000	055

If not, locate it under Browse APIs. The image below shows Drive API as OFF. Click OFF to enable the feature.

Drive API under Browse APIs section	ı	
Directions API	2,500 requests/day	OFF
Distance Matrix API	2,500 requests/day	OFF
DoubleClick Search API	100,000 requests/day	OFF
Drive API	10,000,000 requests/day	OFF
Drive SDK	none	OFF
Elevation API	2,500 requests/day	OFF
Enterprise License Manager API	10,000 requests/day	OFF
Fitness API	86,400 requests/day	OFF

5. Under My Project > APIs & auth, click Consent screen. The following window will appear:

APIs	window	



Quickstart: Run a Drive Ap	× 🗿 Google Developers Console × +		- ð <mark>×</mark>
· ·	ers.google.com/project/eternal-nucleus-803/apiui/consent	▼ C ^a Q Search	☆ 自 ↓ 余 目
Google Developer	's Console	S	Sign up for a free trial. @gmail.com
Projects My Project APIs & auth APIs Credentials Consent screen Push Monitoring Source Code Compute Networking Storage Big Data Support Need help? Privacy & terms 12	Consent screen will be shown to users whenever you request acc Note: This screen will be shown for all of your applications registered EMAIL ADDRESS PRODUCT NAME Product Name HOMEPAGE URL (Optional) PRODUCT LOGO (Optional) PRODUCT LOGO (Optional) This is how your logo will look to end users. Max size: 120x120 px PRIVACY POLICY URL (Optional) TERMS OF SERVICE URL (Optional) GOOGLE+ PAGE (Optional) plus.google.com/ Page ID Save Cancel	in this project	/ this app and Google to use your information in the terms of service and privacy policies. You can

Provide your email address and Product Name, as shown below:



Quickstart: Run a Drive Ap	× 🗿 Google Developers Console 🗙 +		- 6 🗾
+ A https://console.dev	elopers.google.com/project/fluted-bit-803/apiui/consent	⊽ C Search	☆自∔合目
Google Developers	s Console	Sign up for a free	trial. @gmail.com
< Projects	Consent screen The consent screen will be shown to users whenever you request access	is to their private data using your client ID	
My Project			
APIs & auth	EMAIL ADDRESS		
APIs Credentials	@gmail.com	•	
Consent screen	PRODUCT NAME	Logo	
Push	XA Project		
Monitoring		- Project Name would	d like to:
Source Code	HOMEPAGE URL (Optional)		
Compute		Know your basic profile info and list circles.	of people in your 🖉
Networking	April (*) Operative break regret to construct to the status of the		
Storage			▼ C       Q. Search       Image: Control of the second se
Big Data	This is how you have will be be and your	Uberdapert Chansie    Myrpriect/Mitted-bit-805/Applie/consett    Myrpriect/Mitted-bit-805/Applie/consett    Sign up for a free trial. @gmail.com   nt SCRECH    Bert screen will be shown to users whenever you request access to their private data using your client ID.   is screen will be shown for all of your applications registered in this project   DDRESS   @gmail.com   T NAME   ject   T NAME   ject   T Liobo (Optional)   This is how your logo will look to end users.   Max size: 120x120 px   PFOLICY URL (Optional)   OF SERVICE URL (Optional)   • PAGE (optional)   • PAGE (optional)   • PAGE (optional)   • Cancel	
Quenet			
Support Need help?		eers Concole ×	
Privacy & terms 🛛	PRIVACY POLICY URL (Optional)		
		c	Cancel Accept
	TERMS OF SERVICE URL (Optional)		
	GOOGLE+ PAGE (Optional)		
	RAM	C _ :	
		Create Project: My Project	٥
	Save Cancel		

# Consent screen window with email and product details

### Click Save.

6. Now, click **Credentials** under **My Project > APIs & auth**. The following window will appear:



🚺 Quickstart: Run a Drive Ap.	. 🗙 📀 Google Developers Console 🗙 🕂		
	velopers.google.com/project/fluted-bit-803/apiui/credential	▼ C Search	☆ 自 ♣ 俞
Google Developer	s Console	Sign up for a free trial.	@gmail.com
< Projects	OAuth		
My Project	OAuth 2.0 allows users to share specific data with you (for example, contact lists) while keeping their		
APIs	usernames, passwords, and other information		
Credentials	private.		
Consent screen Push	Learn more		
Monitoring	Create new Client ID		
Source Code	0		
Compute			
Networking	Public API access		
Storage	Use of this key does not require any user action or		
Big Data	consent, does not grant		
Ownerst	access to any account information, and is not		
Support Need help?	used for authorization.		
Privacy & terms	Learn more		
	Create new Key		
<<			

Click on **Create new Client ID**. The following pop-up window will appear:

			@gma	ail.com	
	OAuth		1		
My Project	Create Client ID				
APIs & auth	APPLICATION TYPE				
APIs	<ul> <li>Web application</li> </ul>				
	Accessed by web browsers over a ne	etwork.			
Consent screen	Calls Google APIs on behalf of your a	application instead of an end-user.			
Push	Learn more				
Monitoring	<ul> <li>Installed application Runs on a desktop computer or hand</li> </ul>	dheld device (like Android or iPhone).			
Source Code	INSTALLED APPLICATION TYPE				
Compute	Android Learn more				
Networking	Chrome Application Learn more				
Storage	iOS Learn more				
Big Data	PlayStation 4				
	Other				
Support					
Need help?	Create Client ID Cancel				
Privacy & terms 🛛 🖓					
	Create new Key				

# Create Client ID pop-up window

**FRESCHE** LEGACY

On the pop-up window, select **APPLICATION TYPE > Installed application** and **INSTALLED APPLICATION TYPE > Other**.

Click Create Client ID.

7. A window will appear displaying the **Client ID** and **Client Secret**. Please save the Client ID and Secret for later use.

Client ID for native application	
CLIENT ID	990479954586 qhuibatnimni3bnwdafuq48n8b7bciiq apps. geogleusercontent.com
CLIENT SECRET	_4FRHzEW_ganL6ZzQKACjfPH
REDIRECT URIS	urn:ietf:wg:oauth:2.0:oob http://localhost
Reset secret Download JSON Delete	

**Client ID and Client Secret** 

8. On the X-Analysis Client, check to allow options for **DOCX** and **XLSX** on the **Window>Preferences>X-Analysis>General**.



•	Preferences	- □ ×
type filter text	General	⇔ • ⇔ • •
<ul> <li>General</li> <li>Ant</li> <li>Data Management</li> <li>Help</li> <li>Install/Update</li> <li>Java</li> <li>JavaScript JPA</li> <li>Plug-in Development</li> <li>Remote Systems</li> <li>Run/Debug</li> <li>Server Service Policies</li> <li>Tasks</li> <li>Team</li> <li>Usage Data Collector Validation</li> <li>Web</li> <li>Web Services</li> <li>X-Analysis Advanced Folders</li> <li>General X-Data Test</li> <li>X-Redo</li> <li>XDoclet</li> <li>XML</li> </ul>	Setting Preferences. Structure Chart Maximum Diagram Depth Maximum Unexpanded Depth Maximum Files to show in a row in 'Show Files' mode Preferred Volume Limit System Document & View Export as PDF  Mathebox MS Word document Google Drive Export Allow Export to Google Drive as DOCX Allow Export to Google Drive as XLSX Program Structure Chart Default View Level 13  Vumber of records to dis Variable Where Used Default View Level 1  V Object Where Used Entry Level References 7  V Default Source Editor Lpex  Stop 5250 Emulator Others Number of records to display 1000 Restore I	
0	ОК	Cancel

## General Preferences window showing Google Drive Export options

9. Click the **Preferences>Advanced** tab. The following window will be displayed. Provide the saved **Google Client ID** and the **Google Client Secret** in the specified fields.



•	Preferences	_ 🗆
type filter text	Advanced	⇐ ▾ ⇔ ▾
General	Advance Setting Preferences.	
Ant		
Data Management Help	Work with Objects	
Install/Update	Subset Data	
Java	Search Settings	
JavaScript	UML Diagram	
JPA	_	
Plug-in Development	Document Generation	
Remote Systems	Diagram Export	
Run/Debug Server	Synon Data Flow Diagram	
Service Policies	Database Language Translation	No Translation requirec ∨
Tasks	Google Client ID	
Team		
Usage Data Collector	Google Client Secret	
Validation		
Web		
Web Services X-Analysis		
Advanced		
Folders		
General		
X-Data Test		
X-Redo		
XDoclet	Γ	Restore Defaults Apply
XML		Apply
(?)	Г	OK Cancel
U	L	Cancer

# Advanced Preferences window

10. Click Authorize Google Drive from the X-Analysis drop-down menu.



# X-Analysis menu – Authorize Google Drive option

License Manager
New DB400 Connection New DB2 Connection
Mark all for Documenter
Change Application Folder
Open Log Folder Open Application Folder
Authorize Google Drive
Report an Issue

The Authentication URL using the Client ID and Secret will be automatically generated.

11. The **Google Authorization** window will appear. Sign in with your gmail id and password.

<b>\$</b>	Google Authorization	×
URL	https://accounts.google.com/o/oauth2/auth?access_type=online&approval_prompt=auto&client_id=1007793557:	
	Sign in with your Google Account	
Authorize and copy code		
	Email @omail.com	
Paste code from Web Browser		
Authorize Cancel	]	

## **Google Authorization – Sign in window**

12. After sign in, the following window will appear:



# **Google Authorization window**

<b>\</b>	Google Authorization	×
URL	https://accounts.google.com/o/oauth2/auth?access_type=online&approval_prompt=auto&client_id=1007793557	
	- XA Project would like to:	
Authorize and copy code	View and manage the files and documents in your Google (i) Drive	
	By clicking Accept, you allow this app and Google to use your information in accordance with their respective terms of service and privacy policies. You can change this and other Account Permissions at any time.	
	Cancel	
Paste code from Web Browser		
Authorize Cancel		

## Click Accept.

13. The following window containing a code will appear. Copy and paste this code on the **Paste code from Web Browser** box.

# Google Authorization window - with code

<b>+</b>	Google Authorization	×
URL	https://accounts.google.com/o/oauth2/auth?access_type=online&approval_prompt=auto&client_id=1007793557:	
Authorize and copy code	Please copy this code, switch to your application and paste it there:	
Paste code from Web Browser		
Authorize Cancel		

#### Click Authorize.

14. The following window will appear. Click **OK** to confirm the use of the Google Drive feature.

	Google Authorization successful dialog				
٢	X-Analysis ×				
i	Google Authorization successful. This shall be used for the entire X-Analysis session. This needs to be done again for a new session.				
	ОК				

After completing these steps, you will see **Export DOCX to Google Drive** and **Export XLSX to Google** among the **Export Options**.

🕹 Object List	🖹 🕻 CONDET 🕺					
Source List of	CONDET in XAN4CDE	M/QDDSSRC, Lines: 21	, View Level: 5			#1 -
🗏 🔻 🖗 🕶 💵	" 🖛 📴 i 🗵 🔊 🖨					
Seq No	*+. 🕎 Exp	ort to MS Word	+ 4	+ 5	+ 6+	7 ^
0001.00	2 🗽 Expo	ort to MS Excel		UNIQUE		
0002.00	2 💦 Expo	ort DOCX to Google				
0003.00	2 🔤 Expo	ort XLSX to Google	6S 0	TEXT ( ' Cor	itract')	
0004.00	Ann	otate	20A	TEXT ('Pro	duct')	
0005.00	2 💥 Doc	umenter		COLHDG ('H	roduct')	
0006.00	1.	10112100	11A	TEXT ('Sto	ore')	
0007.00	A	XWISIX	15A	TEXT ('Ref	No')	
0008.00	A	XWRICD	3A	TEXT('Trr	Hst Trn Type')	
0009.00	A	XWA5QT	9S 2	TEXT ( ' Cor	tract Qty')	
0010.00	A			EDTCDE (M)		$\checkmark$
<						>

#### **Export Options displaying Google Export**

The document you select would be placed in the google drive, and can be checked using the web browser.

Note: Once authorized, the Google Export feature will work on an active session of X-Analysis. After exiting the X-Analysis platform, you will need to re-authorize the Google drive.

# Appendix N – Code Review feature (TD/OMS support)

#### Note: The TD/OMS* version 7 support is now available for the X-Analysis customers.

The **Code Review** functionality has been added to X-Analysis for harnessing the TD/OMS support. The **Code Review** functionality, effectively, is the problem analysis execution on the selected object. It helps you to view any issues at source/object level while promoting to the next stage or visualize the problem analysis statistics/history on the selected object.

The Code Review functionality is only enabled when the XSCMREVIEW data area is set to 'Y'.

The **Generate Code Review** option is present under the **Audit Options** submenu as can be seen below:



	Audit Options – Gene	rate	Code Review	
	CDXA - XAN4CDEM Tutorial System		<u>^</u>	
2	New Application Area			
¥	Add Alternate Data Library List			
	Reset Library List			
, i	Application Library List			
ğ	Affinity Comparison			
	Refresh Options	•		
e e e e e e e e e e e e e e e e e e e	Derive Business Rules			
🦉 🖄	Import Options			
0	Export Options	+		
	Document Entire Application			
	Document Changed Objects			
▷ 👼	Reengineer Programs			
	Generate Programs			
▷ 🔂	Generate Web Services		Metrics Analysis	
Þ	Generate Data Application		Screen Metrics	
⊳ 6	Data Migration		File Metrics	
⊳ 🖸				
⊳ 6	Inter-Repository Options		Business Process Logic Metrics	
	Audit Options		Specialized Analysis	
			Problem Analysis	
Session Inform	ation.		Generate Code Review	
			Problem Analysis Request History	
			Object Allocation	
			Database Summary	
			Summary Report	
			Initialize Source Archiving	
			Generate Metrics Analysis	
			Edit Problem Audit Limit	
			Edit Problem Categories	
			Generate Problem Analysis	
			View Database Size Statistics	
			view Database Size Statistics	

When you click the option, the following dialog is displayed:



#### Generate Code Review dialog

😂 🛛 Generate Co	ode Review
X-Ref Library	XAN4CDXA
Remove History	NO Y
ОК	Cancel

You can choose to **Remove History**. The default option is **NO**. If you select **YES** then all the previous history will be deleted or removed. Click **OK** to begin the Code generation.

Click the **Problem Analysis Request History** option to review the generated code. The option is shown below:

🔺 🔥 XAN4	CDXA - XAN4CDEM Tutorial System		^	
2	New Application Area			
×	Add Alternate Data Library List			
2	Reset Library List			
G	Application Library List			
<u>c</u>	Affinity Comparison			
⊂ © En C© 13:20 E. E. E. E. S. A. K.	Refresh Options	۲		
	Derive Business Rules			
ě 🕹	Import Options	+		
٥	Export Options	•		
⊳ 0	Document Entire Application			
	Document Changed Objects			
	Reengineer Programs			
Þ 🔂	Generate Programs			
	Generate Web Services		Metrics A	nalvsis
⊳ 6	Generate Data Application		Screen M	
⊳ 💁	Data Migration		File Metri	cs
⊳₿	Inter-Repository Options		Business	Process Logic Metrics
Þ 🔂 🚃				ed Analysis
▷ 🗗	Audit Options		Problem	Analysis
Session Inform	ation.		Generate	Code Review
			Problem	Analysis Request History
			Object Al	location
			Database	Summary
			Summary	r Report
			Initialize S	Source Archiving
			Generate	Metrics Analysis
			Edit Prob	lem Audit Limit
			Edit Prob	lem Categories
			Generate	Problem Analysis
			View Data	abase Size Statistics

#### Audit Options – Problem Analysis Request History

#### **Problem Analysis Request History**

Object	Category	Comment	Date	
ARPGLE	Update date on source and object do not	Request generated by QPADEV001	2015-05-14	
CUSTS	Source member changed after file created	Request generated by XCODERVW	2015-05-05	
CUSTS	Source member changed after file created	Request generated by XCODERVW	2015-05-05	
CUSTS	File has Constraints	Request generated by XCODERVW	2015-05-05	
CUSTS	No Matching Parent Key in derived const	Request generated by XCODERVW	2015-05-05	
CUSTS	Foreign Key value does not match parent	Request generated by XCODERVW	2015-05-05	
XRMETCHGS	Greatest IF/DO block nbr of lines exceeds	Request generated by XCODERVW	2015-04-24	
XRMETCHGS	Greatest IF/DO block nbr of lines exceeds	Request generated by XCODERVW	2015-04-24	
XRMVBIZRMB	Update date on source and object do not	Request generated by XCODERVW	2015-04-24	
XRMVBIZRMB	Unused Procedures	Request generated by XCODERVW	2015-04-24	
XREENGPGM	Update date on source and object do not	Request generated by XCODERVW	2015-04-24	
XREENGPGM	Program has (non-excluded) hardcoded I	Request generated by XCODERVW	2015-04-24	

The **Code Review** functionality can be used for the entire X-Ref library and for individual objects as well.

In the following image, the **Display Code Review** option has been selected on an individual object, **WWCUSTS**.

ode Review fo	r WWCUSTS 5 Records			
Object	Category	Comment	Date	Time
WWCUSTS	Update date on source and object do no	Request generated by XCODERVW Job	2015-04-24	11:13:09
WWCUSTS	Greatest subroutine nbr of lines exceeds	Request generated by XCODERVW Job	2015-04-24	11:13:09
WWCUSTS	Greatest IF/DO block nbr of lines exceed	Request generated by XCODERVW Job	2015-04-24	11:13:09
WWCUSTS	Greatest subroutine nbr of lines exceeds	Request generated by XCODERVW Job	2015-02-27	13:17:45
WWCUSTS	Greatest IF/DO block nbr of lines exceed	Request generated by XCODERVW Job	2015-02-27	13:17:45
<				

#### **Code Review view for WWCUSTS**

## Appendix O - RSE (Remote System Explorer) on RDi

X-Analysis features can be invoked through the Remote System Explorer on RDi. You have to right-click on a specific member name to use the options.

The first step is to install RDi. Download RDi version 9.0 and above (preferably).

Then go to the X-Analysis client interface. If you have installed a new version, then use the **Clean start Eclipse** option. Then, go to **Window > X-Analysis > Open Perspective > Other...** and choose **Remote System Explorer**.

۵	Open Perspective	-		
				1
	epository Exploring			
	ase Debug			
	ase Development			
🌼 Debug	1			
ava 🖏				
🔊 Java B	-			
	E (default)			
	ype Hierarchy			
🖏 JavaSc	ript			
API 🔶				
🕕 🕕 Planni	ng			
🔷 Plug-i	n Development			
🔚 Remot	te System Explorer			
Resou	rce			
_ <b>É⁰ Team</b>	Synchronizing			
🮯 Web				
🔳 X-Ana	lysis			
				1
	ОК	Can	ncel	

#### **Open Perspective – Remote System Explorer**

Click **OK**.



Select the object from the Member List or the Object List as shown below:

Selected object - WWCUSTS
Remote System Explorer - IBM Rational Developer for i
File Edit Navigate Search Project Test XA API Call Run Windo
🔁 🗕 🖫 🕒 🕘 🕪 💷 🔤 🙌 🖓 🔸 🔍 🕫 🔊
📲 Remote Syste 🔀 😪 Team 🛛 🔂 TD/OMS Wor 🖓 🗖
(\$\circ \black black \black black
▷ 🝰 New Connection
> 📑 Local
⊿ 📑 X-Analysis - 192.168.21.102
⊿ 😫 Objects
Work with libraries
▲ Work with objects
Filter created successfully. Expand this again to create an
Work with members
<ul> <li>▶</li></ul>
A Service Normalies
▶ ₩WCUSTS.*pgm.rpgle
Commands
▷ B IBMi Contexts
Jobs
IFS Files
Image: Provide Files
📑 Qshells
X-Ref Libraries
_⊳ 🍪 TD/OMS
X-Analysis - 192.168.21.100

Now right-click on the object to use the X-Analysis options. The following screenshot shows these options:

LEGACY

		X-Analysis O	otions		
a 🕌 Work	c with	libraries objects reated successfully. Expand this aga	ain to create al		
⊳ 🕍 Worl		Go To	×		
⊳ 🚔 Libra ⊳ 🚔 User ⊿ 酔 XAN		Show in Table Monitor			
⊳ 🛃 V ⊳ 📑 Comma	8	Refresh	F5		
<ul> <li>▷ IBMi Co</li> <li>▷ IBMi Co</li> <li>▷ IFS Files</li> <li>▷ IFS Files</li> <li>▷ IFS Spooled</li> <li>□ Qshells</li> <li>▷ IN X-Ref Lil</li> </ul>		Rename Delete Copy Paste Move	F2 Delete		
⊳ 🤯 TD/OMS ⊳ 🔚 X-Analysis -		Update Change Save Restore User Actions	Þ	đ	Remote System Details 🛛 🧟
Properties 🔀		Add To i Project Make Available Offline Debug(Service Entry)	•		
Property		Debug (Prompt)	•		
Attribute		Debug As	•		
Name Number of chil		Run(Prompt) Run As			
Source			· ·		Structure Chart
Text	Ъ	X-Analysis Visualize Application Diagram	, ,		Data Flow Diagram
🦻 🔻 Not conne		Properties	Alt+Enter		

For instance, if you select the **Data Flow Diagram** option then the following dialog will get invoked:

X-Analysis Login dialog on RSE

Nemote system explorer - tow national beveloper for i	
File Edit Navigate Search Project Test XA API Call Run Windo	w Help
🔁 🗕 🖫 🕒 🕘 🕪 💷 🔤 🕺 🎘 🗸 🗇 Lê 🔜 😿	🖹 🕶 🖗 🐻 🖀 🏇 🕶 💽 🕶 🎿 🖌 🖋 🕶 🖉
📲 Remote Syste 🕱 😪 Team 🛛 🚡 TD/OMS Wor 🖓 🗖	
<b>▲ 2</b> ← → @   <b>□</b>   🕏 🎽	
▷ 📸 New Connection	
b E Local	
X-Analysis - 192.168.21.102	
⊿ 👫 Objects	
▷ X→ Work with libraries	🙆 X-Analysis - Login
Work with objects	
Filter created successfully. Expand this again to create an Work with members	IP Address:
▷ ↓ Library list	
▷ Sectionary isc ▷ Sectionary isc	Library: XAOBJ
A 🖶 XAN4CDEM/WWCUSTS	User:
WWCUSTS.*pgm.rpgle	Password:
E Commands	
▷ E≣ IBMi Contexts	OK Cancel
Dobs	
IFS Files	
▷ 🗟 Spooled Files	
Cshells	
DOMS	
Analysis - 192.168.21.100	
A Analysis Tobatolication	

Enter the IP Address and your user name and password to enable the X-Analysis Login.

Remote System Explorer - IBM Rational Developer for i	na hanape heide franklichen Köhnelle ges 11 jan hattere
File Edit Navigate Search Project Test XA API Call Ru	n Window Help
n < x + &   % = u ≪   ♦ ! ⊆ @ [] + 🞦	: 🗟 🕱 ! 🖻 🕶 ! 🖗 ! 🗃 🖀 ! 🏇 🕶 🔘 🕶 🍕 🕶 ! 🖉 🕶 !
📕 Remote Syste 🙁 😪 Team 🛛 🚡 TD/OMS Wor	
New Connection	
E Local	
🔺 📸 X-Analysis - 192.168.21.102	
A bjects	
Vork with libraries	
a 🕌 Work with objects	
Filter created successfully. Expand this again to	o create al
Mork with members	
> 📩 Library list 🥤	🙆 X-Analysis - Login
User libraries	Contraction Contraction
▲ → XAN4CDEM/WWCUSTS	
WWCUSTS.*pgm.rpgle	IP Address:
E Commands	Library: XAOBJ
▷ E IBMi Contexts	User:
> 🎒 Jobs	
IFS Files	Password: ******
Image: Book State Sta	
📑 Qshells	OK Cancel
X-Ref Libraries	
🕟 🧐 TD/OMS	
X-Analysis - 192.168.21.100	

Login details

Click **OK**. This will invoke another dialog that will ask you to specify the X-Ref library.

The dropdown box will show as follows:

LEGACY

X Select X-Ref í۵) XAN4CDXAN Library χανιά ο σχαμ ۸ XAN4CDXAMT O XAN4CDXAM1 XAN4CDXAM2 Ξ XAN4CDXAT XAN4CDXAUC XAN4CDXC XAN4CDXAJR XAN4CDXAM3 F Object Table og XAN4CDXAM4 XAN4CDXAM5 A_NEWXREF A_RDCTSTB XAN4CDXAM6 XAN4CDXAP4 XAN4CDXA XAN4CDXA4 VANACDVAM7

Select X-Ref dialog – Drop-down showing the available X-Ref libraries

Select the X-Ref library.



Click **OK**. The Data Flow Diagram for the selected object will be displayed as follows:



	Data Flow Diagram on RSE	
Remote System Explorer - Program Centered Data Flow Diagram for W	WCUSTS, Total Objects: 16 - IBM Rational Developer for i	
File Edit Navigate Search Project Test XA API Call Run Windo	w Help	
[1] • □ 0 ≙ ● □ ■ # A • 2 9 .c = ₹	📔 🕶 🕸 🛱 🖀 🕸 🕶 🔕 🕶 💁 🚀 🚽 🖉 🖛 🖗 🖛 🖗 🔹 🖗 🗢 🖓 🕶	
		Remote System Explorer 🕱 X-Analysis 🛞 TD/OMS Work Management
	Quickacces	TU/OWS Work Management
🔏 Remote Syste 😥 😪 Team 🛛 🚡 TD/OMS Wor 🖓 🗖	P WWCUSTS 22	- 0
🚄 🕄 (> -> (a) 🖻 😫 🏹	Program Centered Data Flow Diagram for WWCUSTS, Total Objects: 16	⊜ ⊠ <b>-</b> 🕅 - 🕸 🗎 -
b		· · · · · · · · · · · · · · · · · · ·
⊿ 📸 X-Analysis - 192.168.21.102	CONHDRL1 CUSFL3 WWCUSTS	CUSGRSEL CUSTMNT1
⊿ 🔐 Objects	by Debtor/Contract Sites by Number	Customer group Selection     Customer Detail
Work with libraries	Attributes     Attributes     Called Programs 8 Objects	Parameters     Maintenance
a 💥 Work with objects		Parameters
Filter created successfully. Expand this again to create an analysis		
> Mork with members	CUSGRP DISTS Output Files 1 Object	DISTSSEL RTNMSGTEXT
Library list	Customer Groups Distributors	DISTSEL RINNIGERT     Distributor Selection Return message text
Ber libraries     ANACDEM/WWCUSTS	Attributes     Attributes	Parameters     Parameters
ANACLEM/WWCUSIS     WWCUSTS.*pgm.rpgle		Parameters
Commands	SIMEN TRNHSTL3	
E IBMi Contexts	Salespersons by Customer/Period/	SLMENSEL WWCONHDR
b all lobs	Attributes     TransType     CUSTS	Salespersons Selection Work with Orders
St IFS Files	Attributes     Purchases	Parameters     Parameters
Spooled Files	► Attributes	
🗊 Qshells		WWTRNHST XBCCLMSG
X-Ref Libraries		Work with transaction history Clear a Message Queue
D/OMS		Parameters     Parameters
X-Analysis - 192.168.21.100	( III III III III III III III III III I	E State Stat
	📕 Remote System Details 🛛 Tasks 🔒 Object Table 📑 Commands Log 🎤 Terminals 🞌 TD/OMS Components	📅 Thumbnail View 🛛 🗖 🗖
	kjölersterne Beskjörster	
K	Colley Conversion Parko	
Properties 💥 🔍 Remote Scratchpad 🖓 🗖	Physics Physics	
T T T T T T T T T T T T T T T T T T T	Lots Annual Annu	
	Parlamenter Province	
Property Value	The second secon	
Attribute RPGLE	Donos Donos	
Name WWCUSTS		
Number of children 0		
Source XAN4CDEM	Voint Same     Parkon	
Text Work with Customers	1	

The **Variable Where Used** options can also be accessed through the Lpex editor. For this, change the settings through the X-Analysis General Preferences dialog.

	Lpex as the Default Source Editor	
O Preferences	_	
type filter text	General	↓ ↓ ↓ ↓
Context-Aware Search Data Management Dependency Build Ecore Diagram Help i Projects IBM DevOps Services IMP Install/Update Install/Install/Update Install/Install/Update Install/Install/Update Install/Install/Update Install/In	Setting Preferences. Structure Chart Maximum Diagram Depth Maximum Unexpanded Depth Maximum Files to show in a row in 'Show Files' mode Preferred Volume Limit System Document & View Export as PDF  MS Word document Google Drive Export Allow Export to Google Drive as DOCX Allow Export to Google Drive as XLSX Program Structure Chart Default View Level 13  Number of records to di Variable Where Used Default View Level 1  Object Where Used Entry Level References 7 Default Source Editor Lpex 5250 Emulator Others Number of records to display 1000 Restore Default	14   10   5   1000   Paper Size
3	ОК	Cancel

Click **OK** to confirm the change.

Again select the WWCUSTS program and right-click for the context menu and see the Zoom in Lpex option.

Right-click context menu - Zoom in Lpex option

		(-	1			Quick Access	📑 🔛 🖬 Remote	e System Explor	er [ 👱 X-Ana	ilysis (
Navigation Metrics Dashboard		🔓 Programs 🔀								
WORXREFORG     WORXREFTST	^	Object List of *A	LLUS	R/*ALL/*PGM/*ALL/*ALL/*A	L, Total Ob	jects: 161			🙀 +	8 🛛
WUKXREFTST     M XACNVDEMXA - New demo code by Aieet		Library	1	Name Type	Attribut	e Description	Status	Changed	Created	Use
XACNVDEMXB - New demo code by Aject - Java		CL XAN4CDEM			~	Order Entry System	*A	14/02/14	01/09/08	15/
XACTISXA - MF Source Cobol -?Mohammed		R ⁶ XAN4CDEM	EQ.	Zoom Source	i i	Back-out account	*B	14/02/14	03/12/12	15/
XACTISXB - XACTIS MF Cobol -?Mohammed		CL XAN4CDEM	1 🕅	Zoom in Lpex		Build Customer Letter	*A	14/02/14	01/09/08	22/
XAFAMDH - Familiprix XA lib-Dhruv		CL XAN4CDEM	1	Data Flow Diagram		Print Customer Letter	*A	14/02/14	01/09/08	15
MAFAMPRDBI - Familiprix XA lib - DBI		XAN4CDEM	-	Object Where Used		for read source file	*A	06/05/14	06/05/14	15
MAFAMPRIX - Familiprix POC		RE XAN4CDEM				Contacts Maintenance	*A	14/02/14	13/09/10	22
MAFAREWAY2 - Sample 36 Fareway		RE XAN4CDEM		Variable Where Used	- + I	Revert Back Customer Info	*D	14/02/14	04/06/13	22
» KANITO - Japanese Test		R ¹ XAN4CDEM		Hierarchical Structure Chart		Update Customer Info - Version 1	*D	14/02/14	04/06/13	02
XANQUERY - Rafi Zack's XA lib contents		RE XAN4CDEM	th			Update Customer Info - Version 2	*D	14/02/14	05/06/13	22
M XANQUERY2 - Rafi Zack's XA lib contents		R ⁶ XAN4CDEM	θ.	Structure Chart Diagram		Contract Entry	*D	14/02/14	01/09/08	22
> 🖍 XAN4_00		CL XAN4CDEM	ġ,	Inverted Structure Chart		List Correspondence	*A	14/02/14	01/09/08	22
b 10 XAN4_01 b 10 XAN4CDDDL - DDS-> DDL		CL XAN4CDEM		Program Structure Chart		Build Security Fax	*A	14/02/14	01/09/08	15
AIN4CDDDL - DDS->DDL		CL XAN4CDEM CL XAN4CDEM		Screen/Report Design		Add Code to Batch	*B	14/02/14	01/09/08	15
2 Application Area Diagram						Agent Fax Prompt	*A	14/02/14	01/09/08	15
C Data Model Diagram		R ₆ XAN4CDEM		Screen/Report Source		Customer Copy	*D	14/02/14	01/09/08	15
Coverview Structure Chart		RE XAN4CDEM		Consolidated Rules		Customer Site Maintenance	*B	24/02/14	13/09/10	01
L All Objects		CL XAN4CDEM		Annotate		Customer Site Maintainance	*B	07/03/14	01/09/08	22
Programs		RE XAN4CDEM			Customer Site Maintenance	*A	14/02/14	13/09/10	15	
Files		RE XAN4CDEM		Mark for Documenter		Customer Site Selection	*C	14/02/14	13/09/10	22
Source Files		R ^L XAN4CDEM		More Info		Customer group Selection	*C	14/02/14	13/09/10	21
📴 Business Rules		CL XAN4CDEM		Change History		Initialise Customer Record	*A	14/02/14	01/09/08	15
Consolidated Rules	-	CL XAN4CDEM	m	Source Compare		Customer Letter - Stage 1	*B	14/02/14	01/09/08	22
Session Information.	•	R ^P GXAN4CDEM				Update Letter Sequence	*C	14/02/14	01/09/08	22
		CL XAN4CDEM	8	Screen Components		Customer Letter - Stage 2	*B	14/02/14	01/09/08	15
ission Items Description		CL XAN4CDEM	ŧ	Screen Flow Diagram		Customer Library Settings	*D	14/02/14	01/09/08	15
Host Name 192.168.21.102		CL XAN4CDEM	×	Screen Activity Diagram		Customer Menu	*B	14/02/14	01/09/08	15

The following window shows the Variable Where Used option on the Lpex Source Editor.

: 1 + 1 @ @   ●   ∧ +   ♥ ● @ @ @ ♥ € + № 🐘	• 🚳 • 🖄 🗛 🏭 :	X : E ・ @ : 例 : Q ・
Navigation Metrics Dashboard	Se Programs	/ WWCUSTS.RPGLE 23
Image: Additional and the additional additinal additinadditinadditadditional additional addited additional a	Line 8           000109         000200           000200         000200           000200         000400           000500         000500           000500         000500           000500         000500           000500         000500           000500         000500           001500         001500           001500         001500           001500         001500           001500         001500           001500         001500           001500         001500           001500         001500           002200         002200           002200         002200           002500         002200           002500         002500           002500         002500	Column 12 Replace Filement/ExtrAlert/Len+AlDevice+.Keywords++++++Comments++++Comments+++++Comments++++++Comments++++++++++++++++++++++++++++++++++++
<ul> <li>Session Information.</li> </ul>	003000	D Zt Source
Session Items Description Host Name	003200 003300 003400	D Z Journe

X-Analysis Options - Variable Where Used

Note: Switching between the RSE and X-Analysis perspectives (or, if changing the X-Ref library within RSE) will close all the active Editors/Views in X-Analysis.

# LEGACY

### Index

5250 Emulator, 52, 158 Access Path Diagram, 11, 210, 211 Action Diagram, 88, 415, 416, 418, 419, 424 Activity Diagram, 156, 207, 211, 212, 293, 294, 295, 297 Add Status Category, 455 Add User defined Rule, 451 Affinity Comparison, 62, 63, 105, 115, 116 Alternate Data Library, 58, 59, 60, 61 Annotation, 174, 176, 177, 233, 239, 376, 377, 449 Annotation Template, 377 APIs, 456, 458, 459, 461 Application Folder, 42, 43, 70, 325, 350, 373, 374, 428 Archive Data, 117, 313, 314, 316 AS400, 12 Attributes, 174, 177, 178, 179, 396, 399, 437, 441 Audit Options, 9, 75, 76, 123, 253, 254, 267, 274, 277, 288, 420 Bookmark, 145, 170, 171 Business Process Logic, 75, 152, 153, 154, 253, 266, 394, 415, 420, 421 **Business Rule Matching**, 452 Business Rules, 9, 11, 13, 17, 18, 19, 20, 21, 46, 66, 69, 70, 76, 86, 87, 116, 150, 151, 158, 159, 163, 219, 230, 231, 235, 236, 237, 238, 239, 240, 241, 338, 344, 389, 394, 396, 401, 412, 415, 416, 417, 423, 436, 439, 440, 448, 449, 450, 451, 452, 453, 454 Business Rules Analysis, 9, 66, 235 Business Rules Overlay, 46, 150, 448 Business Rules Status Category, 453 Change Rule Status to, 448 Class Diagram, 48, 156, 219, 229, 230, 233, 293, 295, 296, 297 Clean start Eclipse, 425, 435, 473 Code Review, 469, 470, 471, 472 Component Status, 81, 82 Configure Columns, 240, 449, 450 Consolidated Rules, 46, 76, 86, 87, 151, 152, 448 Customised Libraries, 75, 242, 245, 246, 247 Data Content, 219, 227, 231, 233, 340, 345, 386, 388, 392 Data Content Diagram, 227, 340, 345, 386, 392 Data Definition Language, 69, 322 Data Dictionary, 218, 298, 299, 300, 301, 303, 304, 305, 306 Data Flow Diagram, 5, 11, 46, 48, 98, 146, 155, 173, 174, 180, 181, 182, 431, 475, 477, 478 data library, 20, 58, 59, 60, 61 Data Management, 116, 117, 298, 306, 312, 313, 315, 316 data model, 13, 14, 15, 18, 19, 20, 21, 69, 90, 218, 230, 298, 299, 308, 312, 318, 322, 323, 399, 400, 439

Data Model Diagram, 11, 146, 213, 215, 351, 359, 365, 369 Data Modelling, 19, 27, 300, 303 DB2 Connection, 39, 251 DDL, 43, 68, 69, 98, 125, 126, 127, 128, 129, 132, 133, 134, 322, 323, 324, 325, 326, 327, 330 DDL conversion, 127, 129, 134 Development Screen, 89, 90 Difference Analysis, 75, 242, 243, 244 Document Application Area, 116, 348, 350, 362, 363 Document Manager, 9, 41, 71, 116, 335, 336 Documenter, 40, 41, 160, 207, 219, 231, 232, 335, 336, 347, 376, 386, 427, 428 Dreamweaver, 56, 225 Eclipse, 12, 25, 28, 44, 56, 158, 224, 226, 423, 425, 426, 427, 429, 435, 444 Edit Problem Categories, 76, 253, 283, 284, 285 entity relationship diagram, 19, 318 Excluded Rules, 450 Export Options, 68, 72, 116, 144, 160, 258, 265, 318, 319, 323, 326, 331, 336 Exportable Rules, 450 File Analysis, 126, 133 File Connection, 213 File Metrics, 75, 253, 265, 266 Filter by Rule Status, 450, 451 Flowchart, 156, 157, 320, 321, 375 Function Attributes, 82 Function Editor, 219, 220, 221, 233 Function Logic, 294, 295, 296, 297 Function Type, 82, 184, 189, 197, 201, 204, 411 Generate Database Service Programs, 69, 71, 331, 332 Generate Programs, 55, 74, 123, 422 generic file, 17, 23, 24 generic program, 23 Google Drive, 43, 51, 456, 464, 465, 466, 468 Graphical Editor Framework, 431 Hierarchical Structure Chart, 11, 155, 189, 190, 192 Hierarchy Exclusions, 16, 17, 184, 202 IBM i, 9, 12, 13, 19, 27, 39, 45, 71, 100, 158, 242, 249, 251, 325, 331, 378, 427 Interactive Structure Chart, 51 Inter-Repository Options, 75, 242, 244, 246, 247, 248, 249 Inverted Structure Chart, 196, 197 Java, 56, 74, 97, 378, 412, 413, 422, 423, 424, 430 Legend, 143, 144, 163, 164, 169, 180, 183, 194, 195, 196, 198, 200, 208, 211, 214, 375 LFs/Access Paths, 167, 210 License Manager, 28, 32, 34, 36, 37, 38 Manage Linked Repositories, 75, 242, 249, 250, 251 Member List, 76, 84, 85, 167, 293, 440 metadata, 89, 218, 299, 300, 303, 318, 322 Metrics History, 259, 260, 261 Migrated Logic, 417, 418

Narratives, 187, 188, 191, 192, 202 New DB2 Connection, 39, 40, 379 New DB400 Connection, 39 Object Allocation, 75, 276 Object Library, 199 Object List, 47, 76, 77, 78, 79, 80, 81, 101, 103, 158, 161, 166, 207, 344, 366, 420 Object Where Used, 16, 24, 52, 145, 146, 148, 161, 162, 163, 174, 197, 442 OLE Automation, 48, 376, 434, 435 Open Database Connectivity, 318 Open Office Draw, 48 Overridden Files, 186, 187 Overview Structure Chart, 11, 17, 198, 199, 200, 202, 204, 205, 351, 355, 359, 365, 369 Page Designer, 56, 219, 223, 224, 225, 226, 233 Preferences, 44, 45, 46, 47, 49, 50, 52, 53, 54, 55, 56, 158, 189, 224, 225, 254, 255, 257, 264, 378, 379, 433, 434, 448 Preview Designer, 219, 223, 224, 233 Problem Analysis, 75, 76, 126, 128, 129, 133, 253, 274, 275, 288, 405 Problem Analysis Request History, 471, 472 program logic, 20, 21, 182, 230 Program Structure Chart, 11, 51, 146, 155, 197, 198 pseudo code, 86 PTF Analysis, 75, 242, 245, 246, 247, 248 Purge Data, 117, 315, 316, 317 RDi, 8, 12, 158, 425, 431, 473 Referred Files, 192, 193 Re-generate Programs, 423 Relationship Details, 302, 303, 305, 306 Remote System Explorer, 8, 473 Remove History, 471 Reset Perspective, 426 RPG environment, 440 Rule Status Manager, 448, 449 Runtime Environment, 433, 435, 444 Screen Action Diagram, 229, 340, 345, 386, 393 Screen Components, 9, 73, 76, 87, 88, 89, 157, 219, 227, 228, 229, 231, 234, 386 Screen Flow Diagram, 155, 207, 208, 209, 210 Screen Metrics, 75, 253, 262, 263, 264, 265 Screen Source Code, 219, 220 Screen/Report Design, 157, 205, 206, 207, 429 Signon, 25, 26, 380, 430, 445, 447 Source archiving, 281 Specialized Analysis, 75, 253, 266, 267, 268, 269, 272, 273, 274 Spool File, 121, 122, 123, 440 Structure Chart Diagram, 11, 17, 146, 155, 182, 183, 185, 186, 187, 188, 189 Structured Query Language, 322 Subset Data, 48, 117, 312, 313 Summary Report, 75, 253, 277, 278, 279, 280



Synon, 12, 15, 20, 48, 181, 183, 195, 196, 200, 214, 408, 409, 410, 411 SYNON, 399, 440 TD/OMS, 469 Test Process, 117, 118 UML Options, 123, 293, 297 Update Rules, 450 Use SSL, 27, 445, 447 V2, 28 Variable Program Calls, 21, 22 Variable Where Used, 4, 51, 52, 96, 97, 98, 145, 146, 162, 163, 164, 165, 166, 302, 442, 478, 480 Verification, 307, 308, 309, 310 X-2E, 2, 396, 398, 399, 408, 409 XALicenseManagerTool, 28, 29, 30, 31 X-Analysis, 1, 2, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 54, 56, 57, 58, 69, 75, 76, 86, 90, 100, 116, 125, 145, 147, 158, 160, 171, 172, 181, 189, 218, 224, 225, 233, 235, 236, 238, 243, 244, 246, 247, 248, 250, 260, 280, 288, 293, 295, 298, 299, 303, 308, 309, 312, 318, 319, 320, 322, 323, 324, 325, 327, 329, 330, 331, 335, 337, 346, 373, 376, 378, 379, 380, 381, 386, 387, 390, 391, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 408, 409, 415, 419, 425, 426, 427, 428, 429, 430, 433, 434, 435, 436, 437, 438, 439, 440, 442, 443, 444, 445, 448, 452 Suite of products, 10

- X-Analysis Client, 9, 13, 25, 27, 47, 48, 100, 160, 323, 378, 425
- X-Analysis Perspective, 25, 26, 295, 415, 425, 426
- X-Extract, 235, 440