

MIS 5208

Lab 04b: ACL: Key Ideas - Working With Data

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Agenda

- What is ACL Used For
- Basic ACL
- Acquiring Data
- Verifying Data Integrity
- Analyzing Data
- Reporting Your Findings



What is ACL Used For? ACL Features

- ACL can analyze large data sets. The tool provides secure access to information from a variety of sources.
 - Unlimited file size
 - Analyze millions of records



Fraud Analysis Planning



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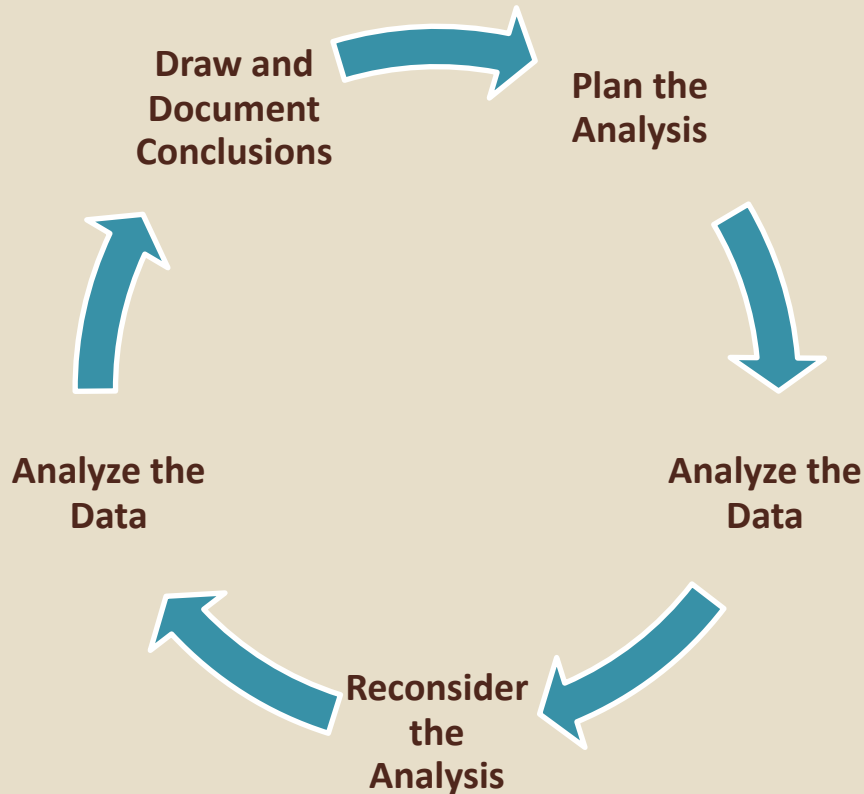
Analysis Planning



Fraud investigations should answer at least six (6) questions



Fraud Analysis Process



- What data currently exists?
- What format is the data?
- Who entered the data?
- Who maintains the data?
- Which department owns the data?
- Is the data accurate and properly formatted? (If not can it be modified to make it suitable?)
- Can you combine the data from more than one source?
- Can you derive the data from data you already have?



Fraud Investigations Answer 6 Questions

- **Who**
 - The number of resources required but also the type of resources including external forensic auditors or fraud investigators will be used and what role they will play.
- **What**
 - Plans should list specific objectives and symptoms of fraud – as well as the systems of interest.
- **When**
 - Investigations are often unplanned – plans should include investigation priority.
- **Where**
 - Plans should include descriptions of data sources, security and access control issues.
- **Why**
 - A clear statement of the fraud risk or allegations referencing applicable laws and regulations as well as the reason for conducting the investigation and the anticipated results.
- **How**
 - Plans should include the type of data analysis – e.g. completeness and integrity, cross-tabulation, duplicates, data profiles, ratio and Benford analysis

Source: Coderre, David (2009-03-17). *Computer Aided Fraud Prevention and Detection: A Step by Step Guide*. Wiley. Kindle Edition.



Fraud Investigation Plan Example

- **Allegation**
 - Pat Currie, a new receiving clerk, reported that the received quantity is not being compared to the order quantity before the items are accepted and the invoice paid.
 - While she has been on the job for only three months, she has noticed that the discrepancy tends to occur more often when Tom Fremont is the officer and the vendor is Steel Cases Limited.
 - Corporate contracting policy has a clear statement (Section J, para. 42) that prohibits the payment if the order quantity, receipt quantity, and invoiced quantity do not agree.
- **Objective**
 - The audit will review contracts to determine if proper procedures are in place and being followed to ensure that the receipt equals the order quantity.
 - All contracts where there are differences will be examined, specifically to determine if there are problems related to quantities ordered and received with contracts raised by Tom Fremont or with Steel Cases Limited.
- **Audit Team**
 - Terry Persson will be the team leader.
 - Sam Bedford (financial auditor) and Jackie Wilson (contract specialist) will be the other full-time members of the team.
 - Dave Dorland will provide CAATTs support and will interface with the systems people to obtain the necessary data.

Source: Coderre, David (2009-03-17). *Computer Aided Fraud Prevention and Detection: A Step by Step Guide*. Wiley. Kindle Edition.



Fraud Investigation Plan

- **Schedule**
 - All team members will cease other projects effective immediately to concentrate on the investigation, with the exception of Jackie Wilson, who will join the team in two weeks.
 - An interim report will be presented to the audit committee on July 8 and a final report should be prepared for signature by audit committee chairman on July 22.
- **Analysis**
 - The contracting database will be backed up to tape and the receipt data to CD-ROM. Information from the contracting database will be extracted (continued) for the last 12 months and compared, by contract and product number, to the receipt database.
 - The audit team will determine the total amount received by contract and by product number, and compare this to the total quantity ordered, by contract and by product number.
 - Further analysis will determine the vendors with the highest variances (by number of items; by number of products; and by value of the variance [unit price × quantity]) and the contracting officer with the highest variances (items, products, and dollars). Note: Partial shipments may be a possible reason for receipt quantity being less than order quantity.
- **Legal Authority**
 - The legal department has been apprised of the allegation.
 - If the analysis indicates that there is a systemic issue and points to one or more contracting officers and/or vendors, audit will immediately notify Ms. K. Lindsay of the legal department.

Source: Coderre, David (2009-03-17). *Computer Aided Fraud Prevention and Detection: A Step by Step Guide*. Wiley. Kindle Edition.



Fraud Detection Categories



Completeness & Integrity



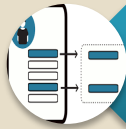
Cross-Tabulation



Duplicates



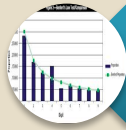
Gaps



Data Profiles



Ratio Analysis



Benford Analysis



Completeness & Integrity

- When extracting and receiving data:
 - The existence of control totals is an important step in ensuring the completeness.
 - Auditors must verify that all of the extracted records have been successfully transferred, and are accessible to and have been properly interpreted by, data analysis software.
 - Auditors should have only the desired records:
 - Tests can be used to ensure that auditors have only the required records, and no extras; these tests include:
 - Filters
 - Recalculating the data
 - Gap Checking
 - Statistical analysis on key numeric fields,
 - Duplicate record checking for duplicate records,
 - Sorting data on key fields
 - Each of these tests, while useful in ensuring the integrity and completeness of the data, also can identify potential fraudulent activity.



Chain of Custody – Access Methods

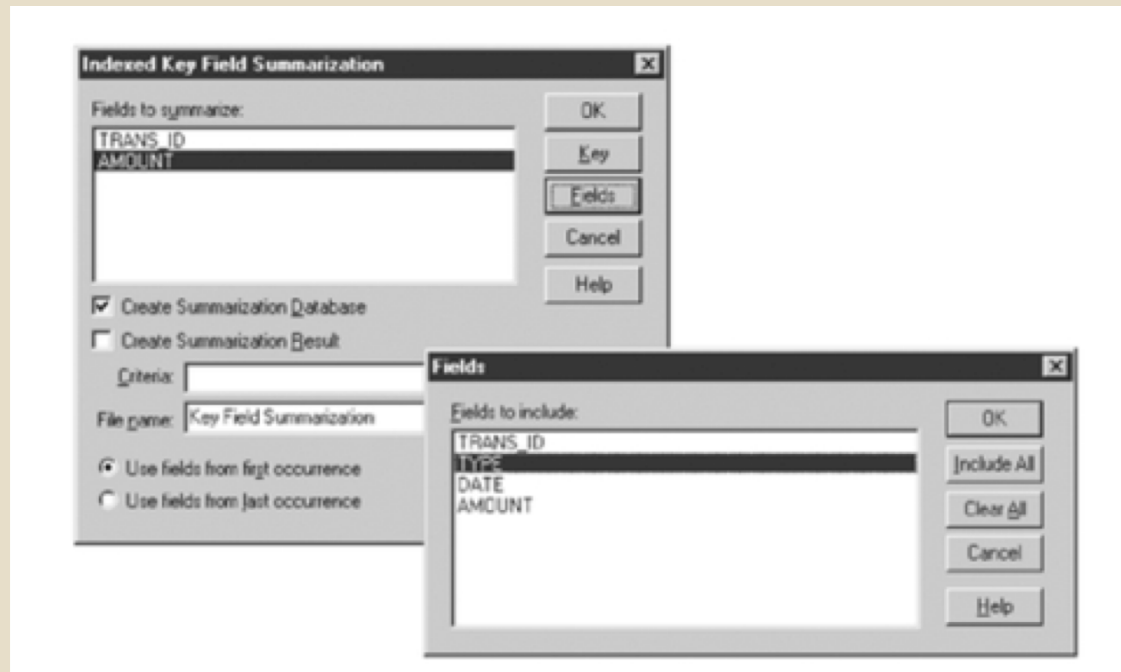
- To maintain chain of custody, you must preserve evidence from the time it is collected to the time it is presented in court. To prove the chain of custody, and ultimately show that the evidence has remained intact, prosecutors generally need service providers who can testify—That the evidence offered in court is the same evidence they collected or received.
- To the time and date the evidence was received or transferred to another provider. That there was no tampering with the item while it was in custody.
- The collection process is the crux of any investigation, and the most important step in any collection is documentation.
- Proper documentation and the ability to validate the findings are essential when a matter goes to trial, especially when the duration of a case lasts for months or years.
- Evidence that was located during the beginning of a case may become critical later on. If the chain of custody and evidence was properly documented, it will be easier to locate the necessary information.
- Additionally, evidence must be authenticated before it can be deemed admissible in court. To authenticate your evidence you must be able to prove your collection process was sound and void of tampering.
- The most effective way to do this is to maintain a documented chain of custody.

Forensically
Sound



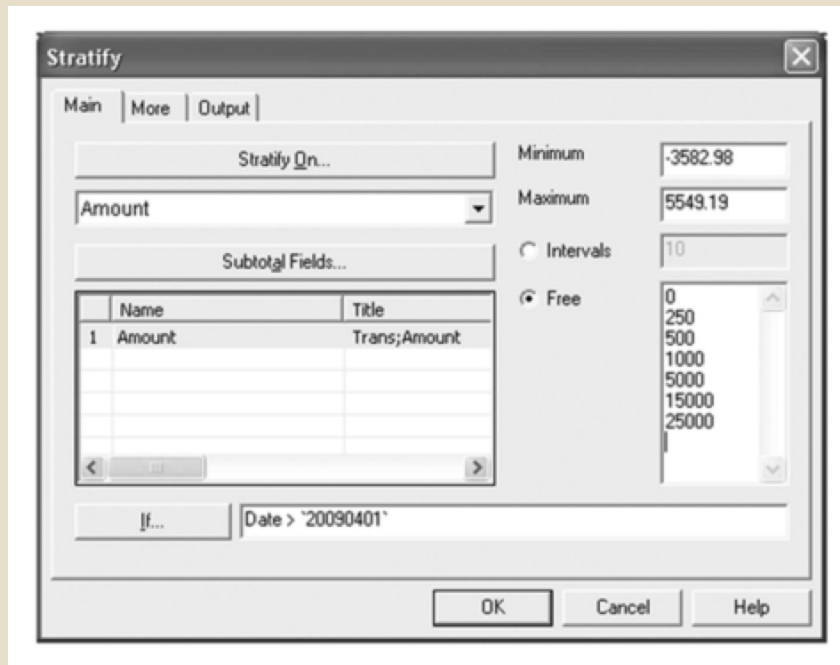
Data Summarization

- Summarizing transactions provides:
 - An overview of the data
 - A better understanding of the information system and conduct more informed analyses.



Data Stratification

- Stratification allows for the logical grouping of data based on specific range values for the data.



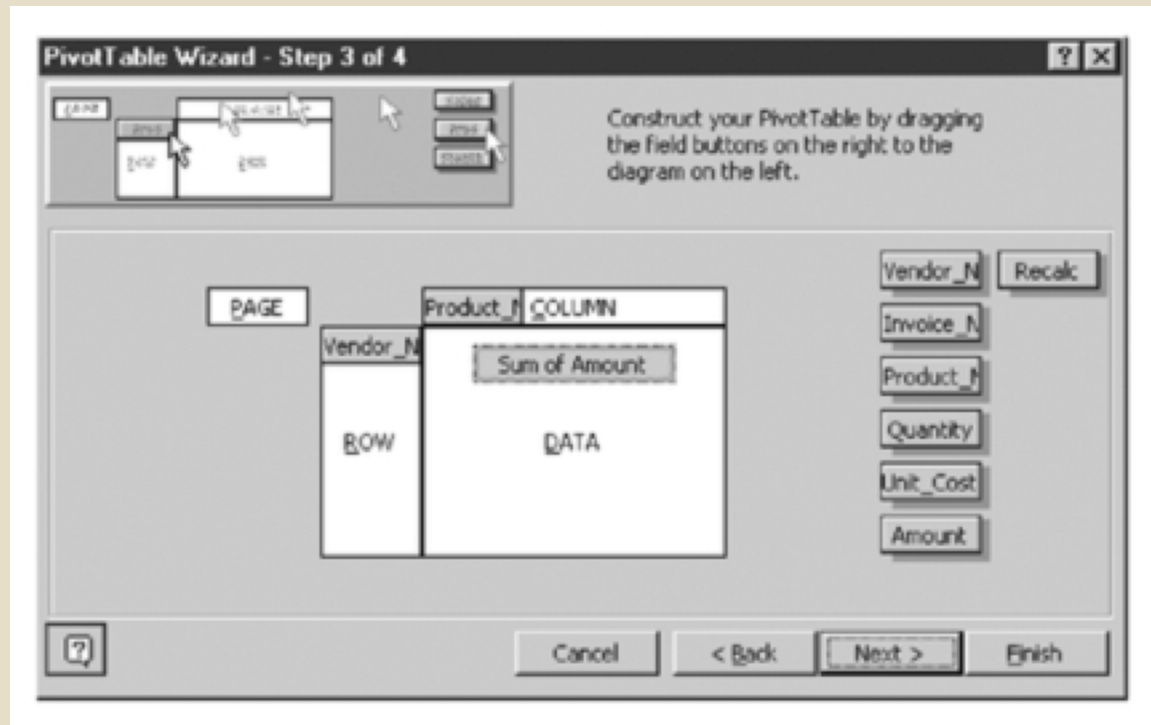
**Why and how
would this be
useful?**

- Like statistical analysis, a stratification of a numeric field will give a high-level view of the data.
- Stratifying data will show how many records fall into ranges, or strata, of the selected numeric field.



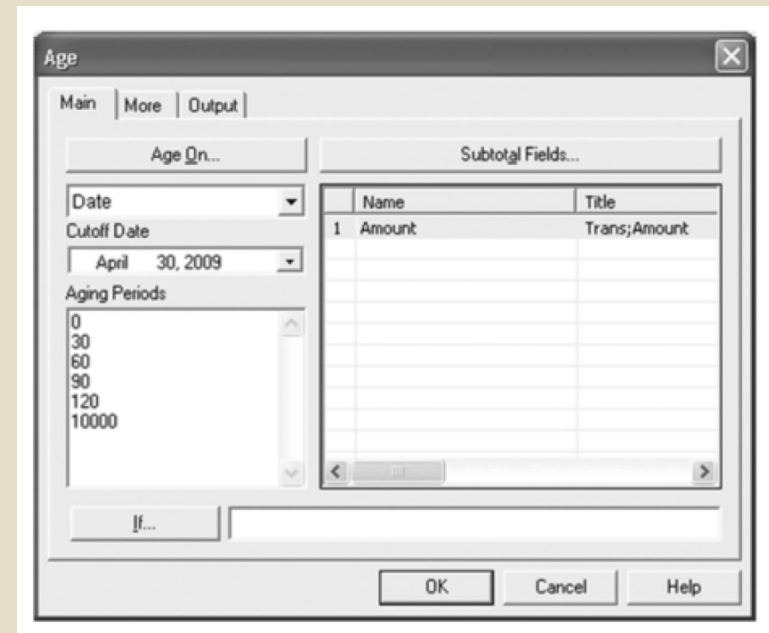
Cross Tabulation and Pivot Tables

- Making sense of data often means finding the best way to look at it.
- Cross tabulation, or pivot tables, is a method of structuring the records to make it easier for auditors to view the data.
- Data is often more understandable when presented in a table format.
- The basic principle involves taking a series of records and creating a two-dimensional table or array.



Aging Data

- Aging data calculates the number of days between two dates, and can provide auditors with valuable information in a variety of settings, such as when the timing of key events is critical to their validity and appropriateness.
- By aging data, one can calculate or highlight various items for further investigation, including:
 - Overdue accounts receivable or accounts payable
 - Favorable credit terms
 - Inventory turnover rates
 - Dormant accounts
 - Records with future, blank, or otherwise invalid dates
 - Items past a cutoff dates
 - Contracts awarded before contract closing date
 - Bids accepted after the bid closing date
 - Transactions outside of the billing period
 - Mean time to failure for equipment
 - Length in days of various activities



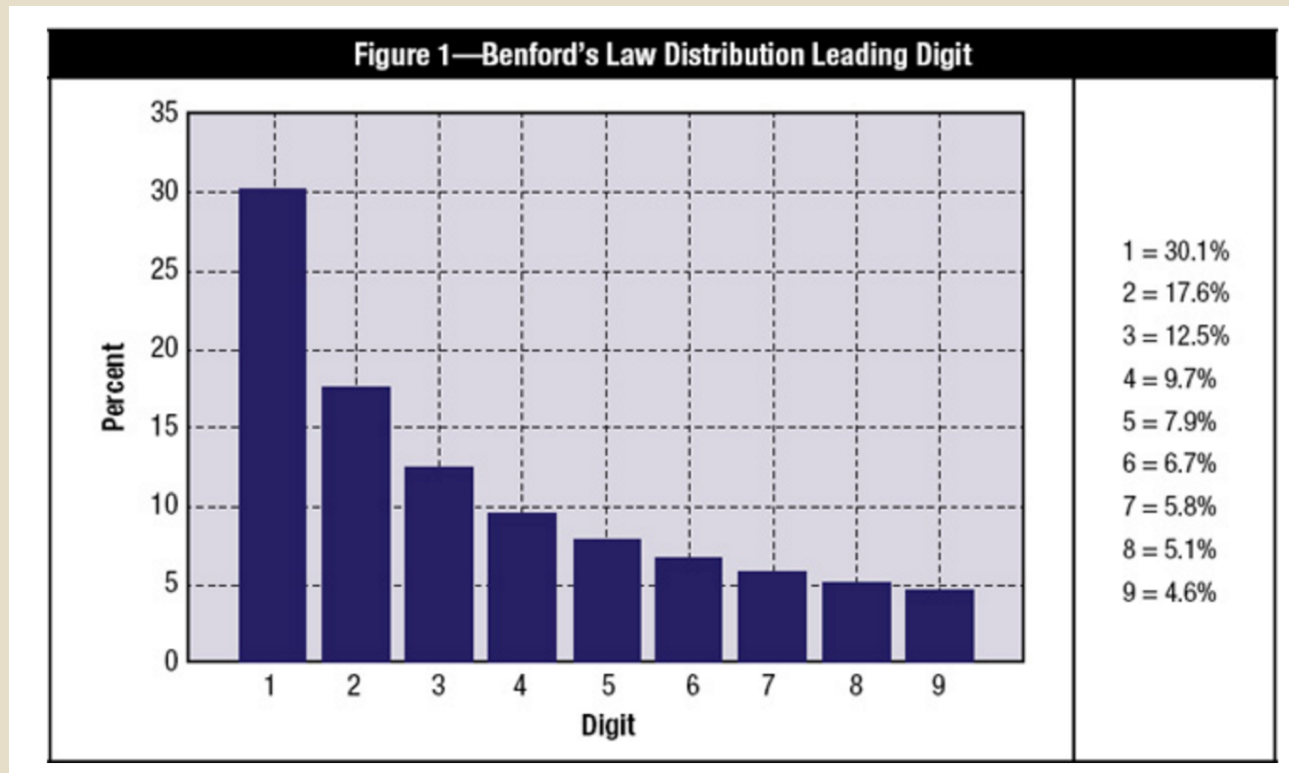
Ratio Analysis

- Ratios are easy to understand and simple to compute.
- Auditors use financial ratios to compare different values to determine if they seem reasonable:
 - Rental Car – 5 days rental - \$10,000
 - Rental Car – 1 day rental – 2000 miles – mileage charge
 - Hotel Stay – 5 Days – \$22,000
- Ratios are just a raw computation and must be looked at from a “common sense” perspective.



Benford's Law

- Benford's Law (which was first mentioned in 1881 by the astronomer Simon Newcomb) states that if we randomly select a number from a table of physical constants or statistical data, the probability that the first digit will be a "1" is about 0.301, rather than 0.1 as we might expect if all digits were equally likely.



ACL Demo



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ACL Home Screen

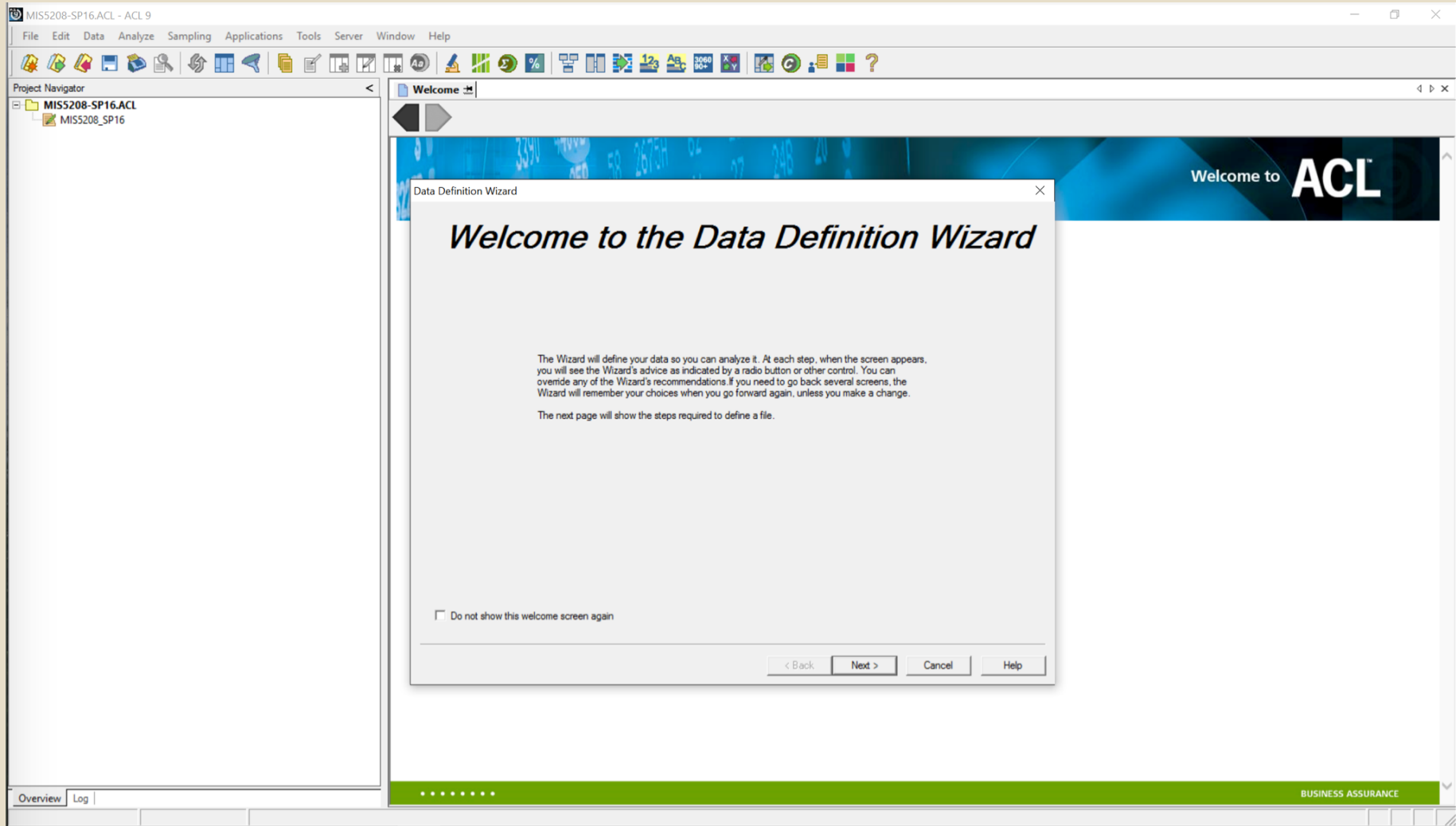
The screenshot shows the ACL Home Screen software interface. At the top is a menu bar with options: File, Edit, Data, Analyze, Sampling, Applications, Tools, Server, Window, Help. Below the menu bar is a toolbar with various icons for file operations and analysis. The main window is titled "Welcome" and features a blue header banner with the text "Welcome to ACL". The main content area is divided into three sections: "ACL Projects" with links for "Create a new project" and "Open an existing project"; "ACL Weblinks" with links for "ACL Homepage", "Online Learning", and "Software/Manual Downloads"; and "Recent Projects" listing "MIS5208" and "ACL_Demo". A "Project Navigator" pane on the left shows "(No Open Project)". At the bottom, there is a status bar with "Overview" and "Log" buttons on the left, a series of dots in the center, and "BUSINESS ASSURANCE" on the right.



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Create a New Project

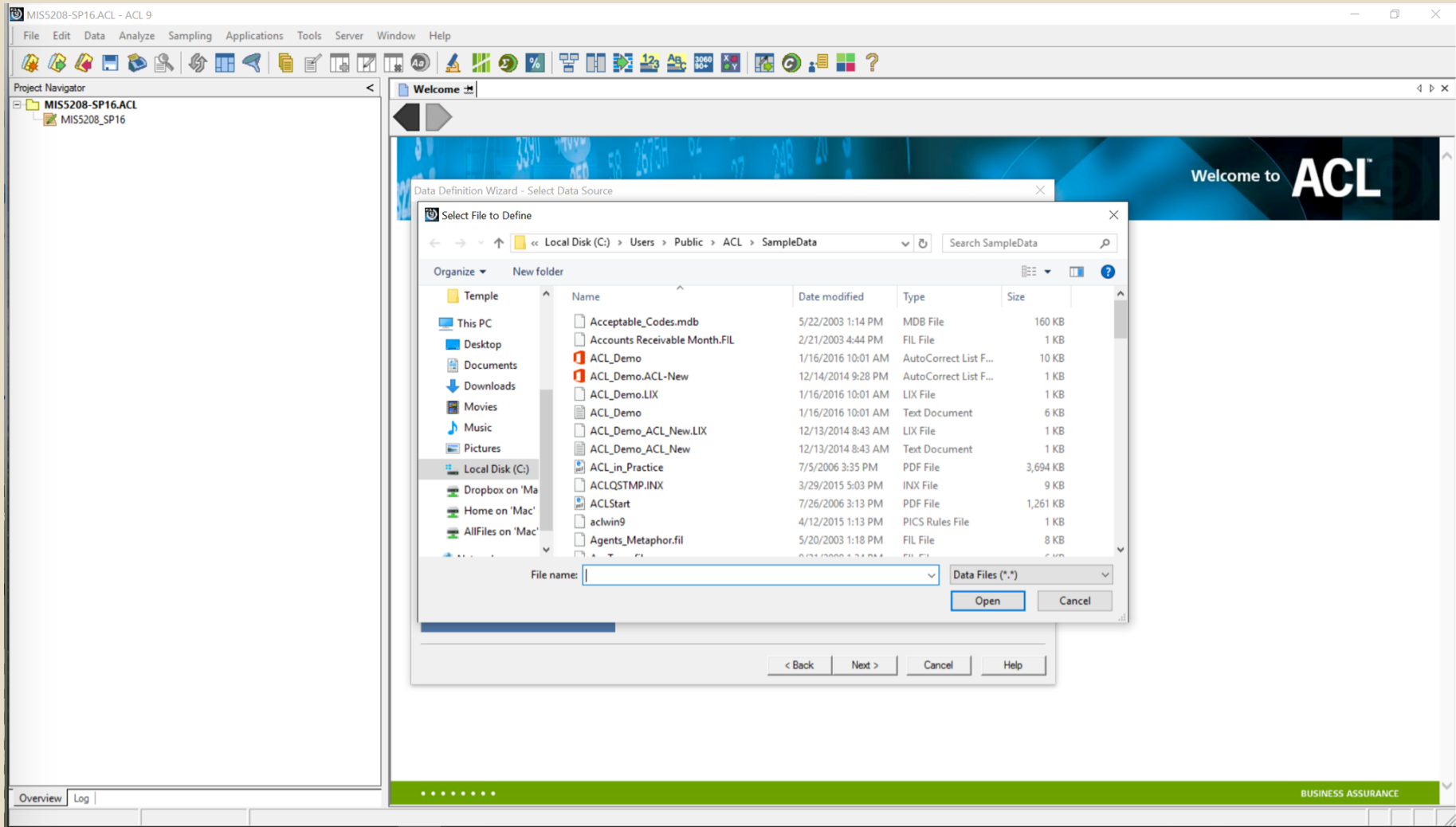


Acquiring Data - The Data Definition Wizard

The screenshot displays the ACL software interface. The main window shows a 'Welcome to ACL' banner and a 'Data Definition Wizard - Select Data Source' dialog box. The dialog box has a left sidebar with steps: 'Select Platform' (checked), 'Select Data', 'Identify Properties', 'Define Fields/Records', 'Edit Field Properties', and 'Finish'. The main area of the dialog is titled 'Specify how to get your data file.' and contains three radio button options: 'Disk: Your file is on a disk (hard drive, floppy or network server).', 'ODBC: Select ODBC to import data from ODBC compliant databases such as Oracle or MS Access, to name but two. This will take you to the ACL ODBC Wizard.', and 'External Definition: Your file is either an AS/400 FDF, PL/1, or a COBOL file definition.' The 'Disk' option is selected and highlighted with a red rectangle. At the bottom of the dialog are buttons for '< Back', 'Next >', 'Cancel', and 'Help'. The background software window includes a menu bar (File, Edit, Data, Analyze, Sampling, Applications, Tools, Server, Window, Help), a toolbar, and a Project Navigator on the left showing a project named 'MIS5208-SP16.ACL' with a sub-project 'MIS5208_SP16'. The bottom status bar shows 'Overview Log' and 'BUSINESS ASSURANCE'.



Acquiring Data - The Data Definition Wizard



Data Import

The screenshot displays the ACL software interface. The main window is titled "MIS5208-SP16.ACL - ACL 9" and features a menu bar (File, Edit, Data, Analyze, Sampling, Applications, Tools, Server, Window, Help) and a toolbar. The Project Navigator on the left shows a folder structure for "MIS5208-SP16.ACL" containing "MIS5208_SP16". The main workspace shows a "Welcome to ACL" banner. A "Data Definition Wizard - File Format" dialog box is open in the foreground. The wizard has a progress bar on the left with steps: "Select Platform" (checked), "Select Data" (checked), "Identify Properties" (unchecked), "Define Fields/Records" (unchecked), "Edit Field Properties" (unchecked), and "Finish" (unchecked). The right pane of the wizard lists file formats with radio buttons: "dBASE compatible file", "Delimited text file", "SAP private file format", "AccPac master file", "Print Image (Report) File", "Excel file" (selected), "Access database", "XML file", "XBRL 2.1 file", and "Other file format". The wizard includes "< Back", "Next >", "Cancel", and "Help" buttons at the bottom.



Data Import

The screenshot displays the ACL software interface. The main window is titled "MIS5208-SP16.ACL - ACL 9" and features a menu bar (File, Edit, Data, Analyze, Sampling, Applications, Tools, Server, Window, Help) and a toolbar. The Project Navigator on the left shows a folder structure for "MIS5208-SP16.ACL" containing "MIS5208_SP16". The main workspace shows a "Welcome to ACL" banner. A "Data Definition Wizard - File Format" dialog box is open in the foreground, displaying a progress bar with steps: "Select Platform" (checked), "Select Data" (checked), "Identify Properties", "Define Fields/Records", "Edit Field Properties", and "Finish". The dialog also lists file formats: "dBASE compatible file", "Delimited text file", "SAP private file format", "AccPac master file", "Print Image (Report) File", "Excel file" (selected), "Access database", "XML file", "XBRL 2.1 file", and "Other file format". Navigation buttons at the bottom of the dialog include "< Back", "Next >", "Cancel", and "Help". The bottom status bar of the software shows "Overview | Log" and "BUSINESS ASSURANCE".



Finish the Import

The screenshot shows the ACL software interface. The main window displays a 'Welcome to ACL' banner. A 'Data Definition Wizard - Final' dialog box is open, showing a progress list on the left and a table of field definitions on the right. The progress list includes 'Select Platform', 'Select Data', 'Identify Properties', 'Define Fields/Records', 'Edit Field Properties', and 'Finish'. The table lists the following fields and their definitions:

Value	Definition
Table Data Source File	Y:\Dropbox\Temple\MISS208 SP15\Labs\...
Character Set	ASCII
Record Length	23
Skip Length	0
Number of Fields	3
Field Name	Data Type
F1	NUMERIC
F2	DATE
F3	NUMERIC

Buttons at the bottom of the wizard include '< Back', 'Finish', 'Cancel', and 'Help'. The bottom status bar of the software shows 'Overview Log' on the left and 'BUSINESS ASSURANCE' on the right.



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Import Results

MIS5208-SP16.ACL - ACL 9

File Edit Data Analyze Sampling Applications Tools Server Window Help

Project Navigator

- MIS5208-SP16.ACL
 - MIS5208_SP16
 - MIS5208_SP16_EmployeeDetail

Filter: Index: (None)

	F1	F2	F3
1	1	01/01/2014	1714
2	1	01/02/2014	114
3	1	01/03/2014	818
4	1	01/04/2014	1103
5	1	01/04/2014	120
6	1	01/05/2014	323
7	1	01/06/2014	675
8	1	01/06/2014	198
9	1	01/07/2014	1195
10	1	01/07/2014	1688
11	1	01/09/2014	64
12	1	01/10/2014	597
13	1	01/11/2014	17
14	1	01/13/2014	4749
15	1	01/13/2014	4155
16	1	01/14/2014	1587
17	1	01/14/2014	1387
18	1	01/14/2014	2876
19	1	01/14/2014	160
20	1	01/19/2014	35
21	1	01/21/2014	188
22	1	01/22/2014	4975
23	1	01/22/2014	80
24	1	01/23/2014	79
25	1	01/24/2014	502
26	1	01/24/2014	240
27	1	01/24/2014	21
28	1	01/25/2014	900
29	1	01/25/2014	80
30	1	01/25/2014	49
31	1	01/26/2014	2764
32	1	01/26/2014	180
33	1	01/27/2014	4311
34	1	01/28/2014	133
35	1	01/30/2014	4264
36	1	01/31/2014	138
37	1	02/01/2014	2791
38	1	02/02/2014	4190
39	1	02/04/2014	23
40	1	02/07/2014	174
41	1	02/09/2014	1384
42	1	02/10/2014	193
43	1	02/12/2014	679
44	1	02/12/2014	183
45	1	02/15/2014	1565
46	1	02/15/2014	1233
47	1	02/18/2014	2858

Overview Log Default_View

MIS5208_SP16_EmployeeDetail | 8,871 Records



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Open an Existing Project

The screenshot displays a software application window with a menu bar (File, Edit, Data, Analyze, Sampling, Applications, Tools, Server, Window, Help) and a toolbar. The Project Navigator on the left shows a tree structure for 'MIS5208.ACL' containing 'MIS5208', 'Scripts', 'Tables', and 'Workspaces'. The main window shows a table with the following columns: DATE1, DUE, NO1, REF, TYPE, and AMOUNT. The table contains 47 rows of data. The status bar at the bottom indicates 'Metaphor_AR_2002' and '772 Records'.

	DATE1	DUE	NO1	REF	TYPE	AMOUNT
1	08/20/2002	09/19/2002	795401	205605	CN	-474.70
2	10/15/2002	11/14/2002	795401	206300	IN	225.87
3	02/04/2002	03/06/2002	795401	207137	IN	180.92
4	02/17/2002	03/18/2002	516372	211206	IN	1610.87
5	04/30/2002	03/18/2002	516372	211206	TR	-1298.43
6	05/21/2002	06/20/2002	518008	212334	CN	-12.23
7	05/21/2002	06/20/2002	784647	212297	IN	737.36
8	06/10/2002	07/10/2002	518008	212592	CN	-37.15
9	06/30/2002	07/30/2002	501657	212824	IN	1524.32
10	07/17/2002	01/01/2002	222006	43614X	PM	539.97
11	07/28/2002	08/27/2002	230575	213052	IN	8.85
12	08/10/2002	09/09/2002	516372	213133	CN	-212.56
13	08/10/2002	09/09/2002	516372	213134	CN	-76.01
14	08/10/2002	09/09/2002	516372	213135	CN	-121.11
15	08/10/2002	09/09/2002	516372	213136	CN	-80.74
16	08/10/2002	09/09/2002	516372	213137	CN	-74.97
17	08/10/2002	09/09/2002	516372	213138	CN	-10.70
18	08/10/2002	09/09/2002	516372	213139	CN	-80.74
19	08/10/2002	09/09/2002	516372	213151	CN	-12.81
20	08/17/2002	09/16/2002	516372	213204	CN	-18.34
21	08/17/2002	09/16/2002	836004	213194	IN	2151.72
22	08/17/2002	09/16/2002	836004	213184	IN	1469.77
23	08/21/2002	11/29/2002	812465	213227	IN	3582.98
24	08/27/2002	09/26/2002	836004	213240	IN	475.99
25	08/28/2002	09/27/2002	478604	213256	IN	251.81
26	08/31/2002	11/29/2002	065003	213248	IN	874.97
27	08/31/2002	09/30/2002	516372	213285	CN	-80.74
28	09/02/2002	10/02/2002	262001	213290	IN	1666.32
29	09/02/2002	10/02/2002	262001	213293	IN	998.19
30	09/02/2002	12/01/2002	262001	213294	IN	810.12
31	09/02/2002	03/01/2002	262001	213295	IN	3567.34
32	09/02/2002	12/01/2002	065003	213277	IN	1280.20
33	09/02/2002	12/01/2002	065003	213296	IN	945.40
34	09/02/2002	12/01/2002	641464	213297	IN	665.28
35	09/02/2002	10/02/2002	262001	213264	IN	892.80
36	09/03/2002	12/02/2002	262001	213299	IN	1215.54
37	09/03/2002	12/02/2002	925007	213304	IN	614.78
38	09/03/2002	10/03/2002	376005	213309	IN	931.55
39	09/03/2002	10/03/2002	501657	213328	IN	1030.43
40	09/03/2002	03/02/2002	501657	213327	IN	3633.40
41	09/03/2002	12/02/2002	501657	213326	IN	945.40
42	09/03/2002	03/02/2002	501657	213325	IN	4426.14
43	09/03/2002	12/02/2002	925007	213318	IN	1418.09
44	09/03/2002	03/02/2002	925007	213317	IN	2180.04
45	09/04/2002	12/03/2002	925007	213342	IN	662.11
46	09/04/2002	03/03/2002	925007	213369	IN	2906.72
47	09/04/2002	12/03/2002	925007	213370	IN	945.40