



Integrated Access to PI Process Book Displays



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Agenda



- Introduction
- About Coors
- Our PI System
- The Problem - Integrating PDI Files
- The Solution - Tree View Menu
- The Details - VBA Architecture
- Conclusion

Introduction



Marty Williams
Coors Brewing Company
Operations Information Technology
(Packaging)

Coors Brewing Company



- Third Largest Domestic Brewer
- 3 Plants - Golden, CO, Elkton, VA, Memphis, TN
- Over 15 Million Barrels of Beer Packaged in Golden (465 Million Gallons) - 21 Million Barrels Brewed
- Golden - Largest Single Brewery in the World
- Elkton and Memphis Package Over 6 Million Barrels Total

PI System



- Golden - 2 Servers, Process and Packaging
- Golden Process - Malting, Brewing and Fermenting Has Over 66,000 Tags
- Golden Packaging - Over 3,500 Tags
- Elkton Has Over 7,000 Tags
- Memphis Has Over 8,700 Tags

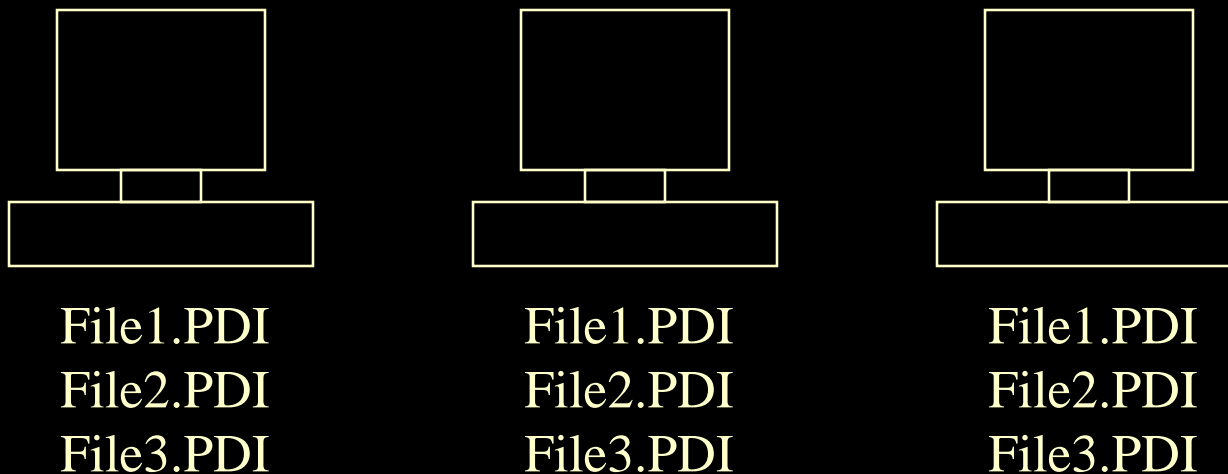
The Problem



- PDI Files Used to Display Trends and Process Status Overview Screens
- PDI Files Stored on Local Hard Drives of Each PC on Plant Floor
- Difficult to Maintain Files
- Accessibility of Files Difficult for Operators

The Problem (Cont'd)

Each PC on the Factory Floor had Individual Copies of PDI Files



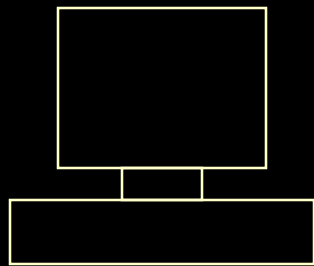
The Solution



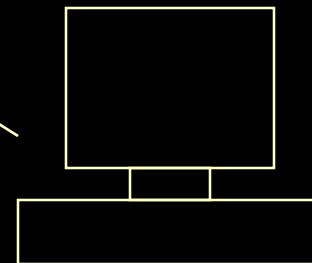
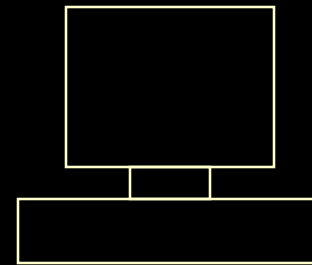
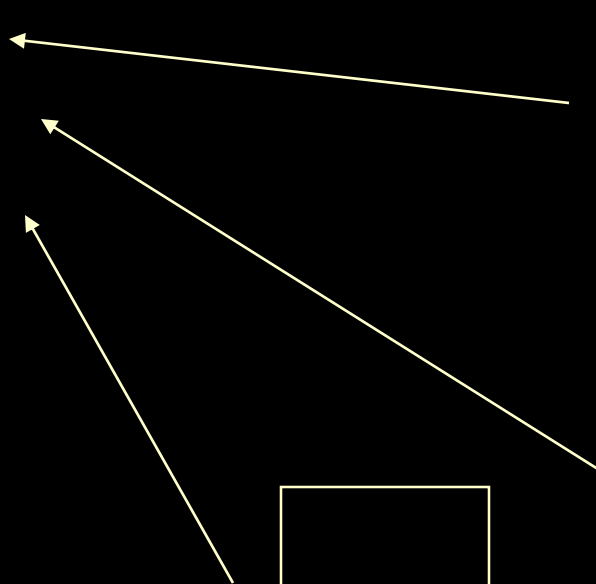
- We Stored all PDI Files on a Single Network Drive
- We Developed a Common Menu System
- We Used the Microsoft Tree View Control to Build a PDI Menu Selection System
- Relational Database Tables used for Tree Branches and Nodes

The Solution (Cont'd)

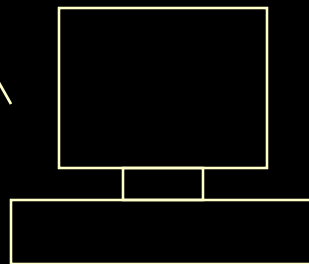
Network File Server



Menu.PDI
File1.PDI
File2.PDI
File3.PDI



Factory Floor
PC's



Golden



Packaging Display Menu

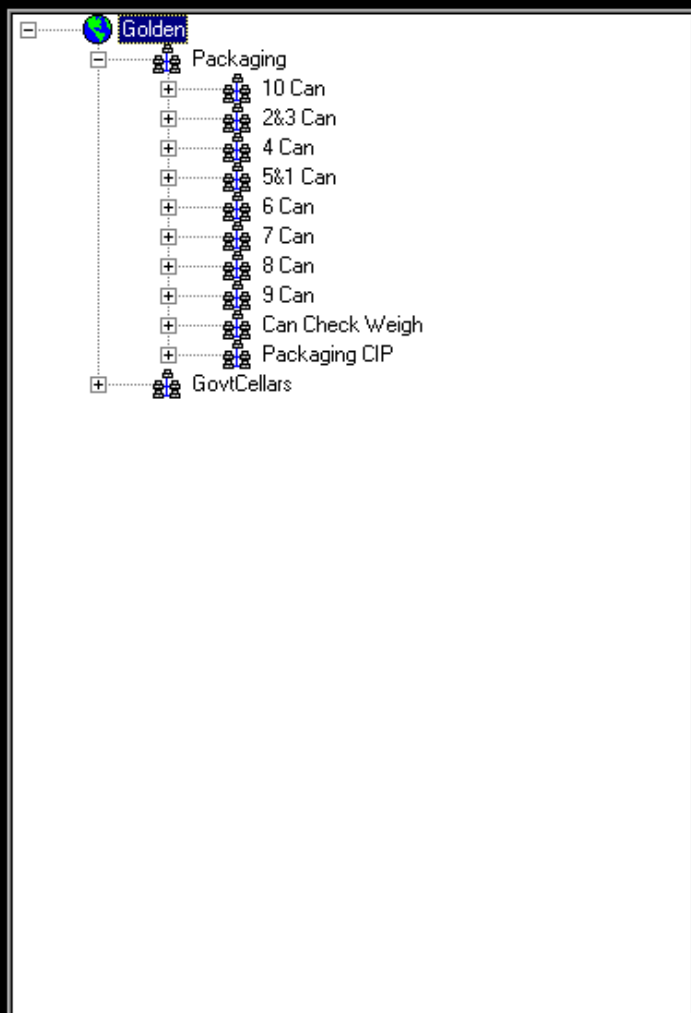
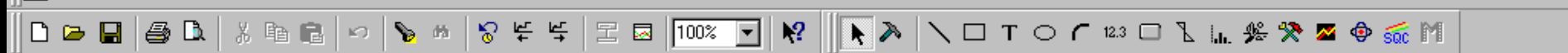
ePAC
Electronic Packaging at Coors

Golden
Packaging
GovtCellars



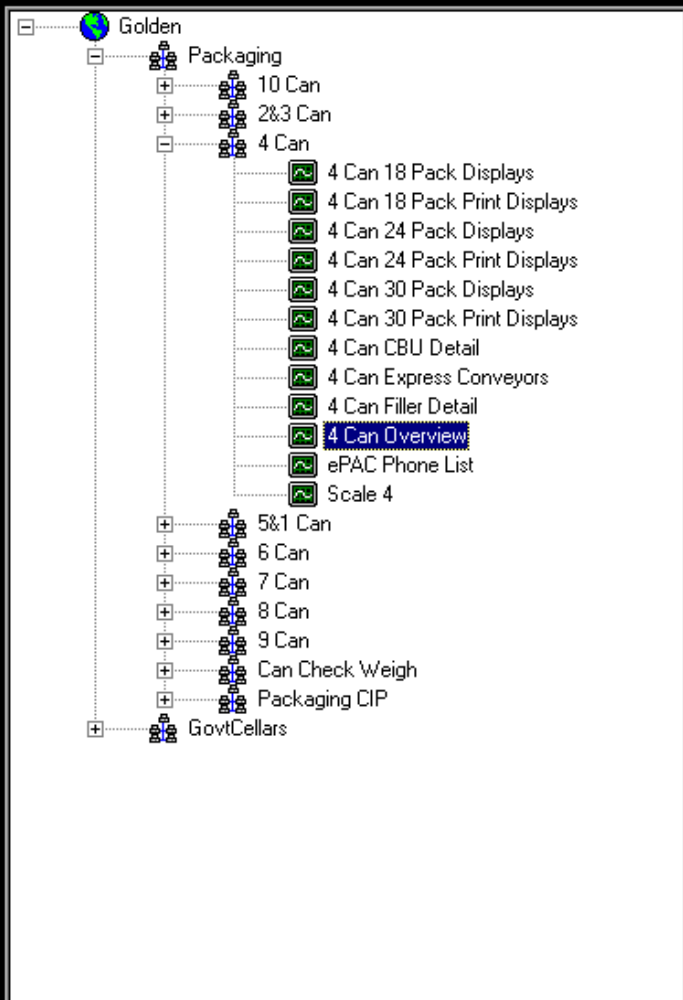
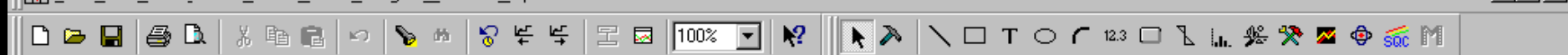
Packaging Display Menu

ePAC
Electronic Packaging at Coors



Packaging Display Menu

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Electronic Packaging at Coors



Coors®

Packaging Display Menu

ePAC
Electronic Packaging at Coors

4 Can Overview

Alpha Code/Pull Date:

AC161 MAY12

PLC Clock

14: 4 :13

MultiPacker Exceptions:

No Packer Exceptions

Scheduled Quantity: 86,400

Produced Cases: 37,486

Remaining Quantity: 48,914

MultiPacker

Status: ON
Case Count: 37,529
Speed: 75 Units/Min
Pack Type: 18

Accumulation Table 0.0 % Full

Closer Status: ON

Lid Feed Status: Online

Full Can Conveying

Closer

FILTEC TOTALS

Thru-Put	Rejects
674,239	703
Down Cans	%
49	7.0

Filtecs

Filler Speed

Setpoint: 500 CPM

Actual: 500 CPM

#4 FILLER

Bowl Level: 0.0 % Full

Beer Temp: 9.4 Deg C

Shroud Temp: 14.0 Deg C

Filler Status: ON

Filler Exceptions:

No Filler Exceptions

UPL#2: READY

UPL#2

UPL#1

UPL#1: Running

Express Conveyor Exceptions:

No Express Exceptions

CBU Exceptions:

No CBU Exceptions

Cell Bin Unloading

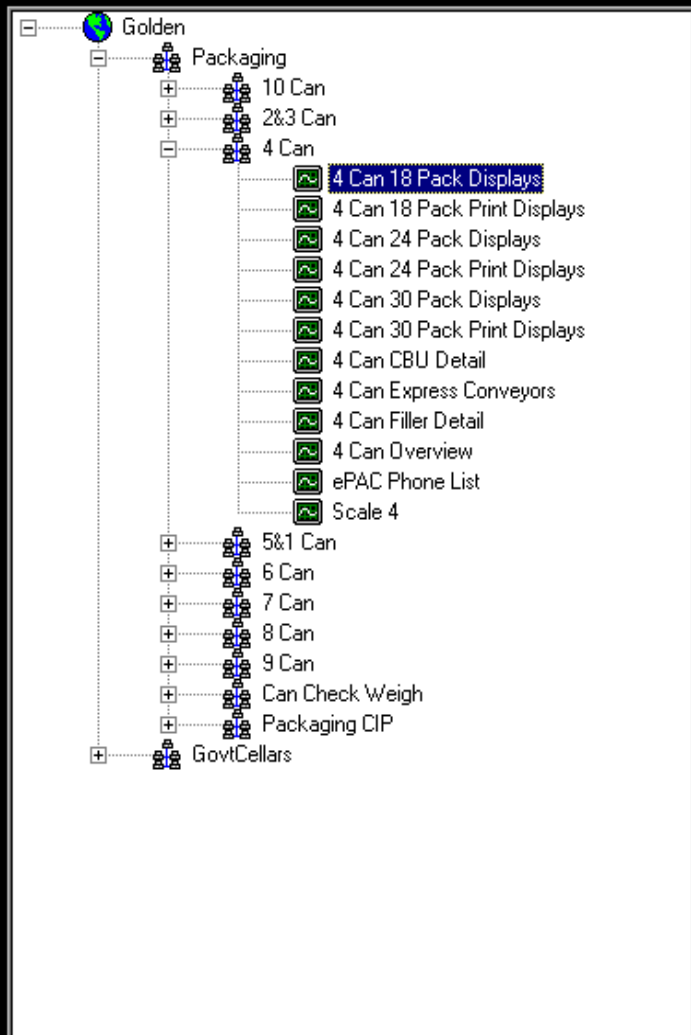
Screen Layout

PB Menu

Express Conveyors

CBU Detail

Filler Detail



Packaging Display Menu

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Cases Yesterday 12502

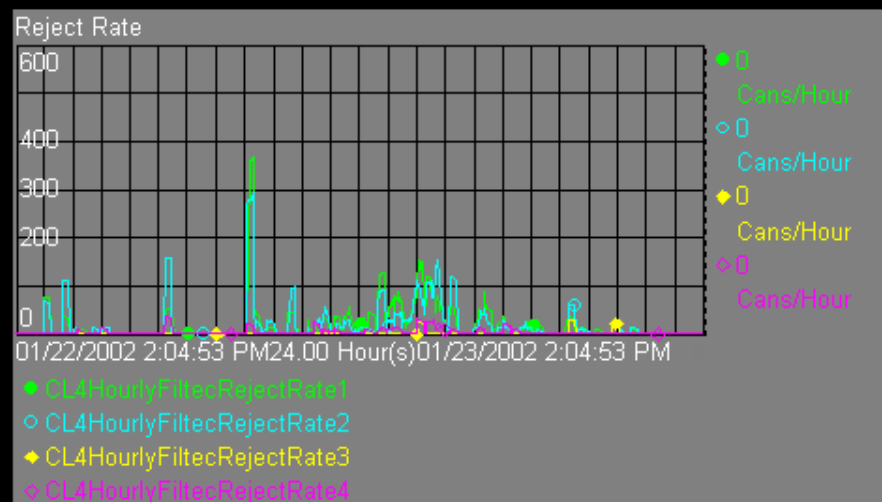
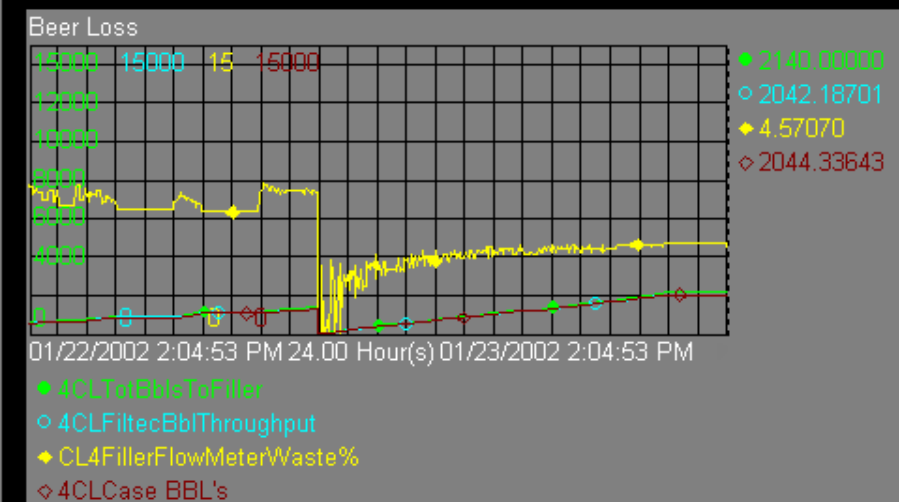
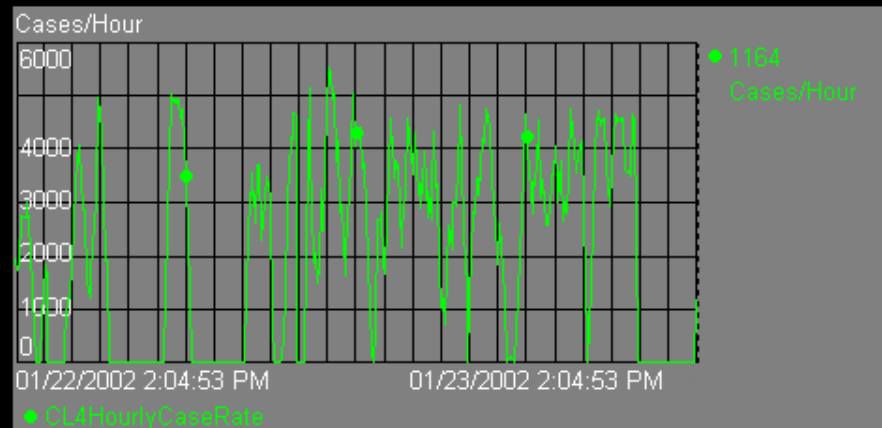
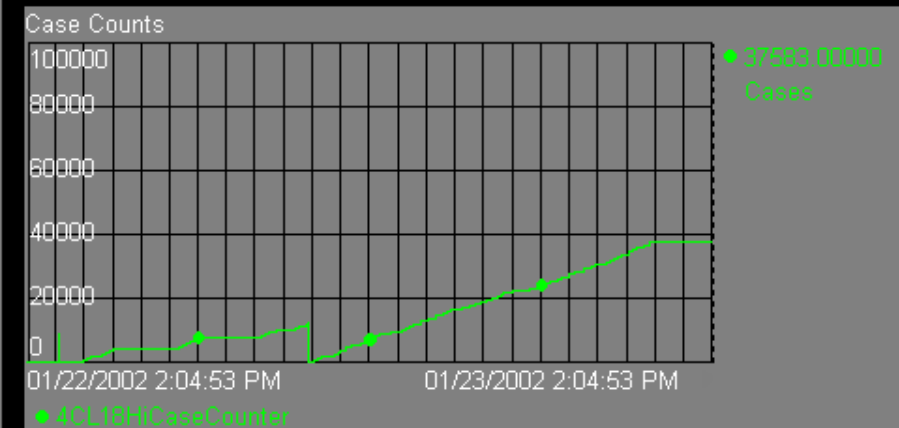
4 Can Line 18 Pack

PB Menu

4 Can Print

4 Can 24 PK

4 Can 30PK



Filler Loss (BBL's)
97.81

FilterC Rejects

#1	#2	#3	#4
328	290	28	57

The Details



- Factory Floor Process Book Shortcut Points to Menu.PDI File on Network Server
- Each Process Book Display Has a Button That Points Back to the Menu.PDI File
- Process Book Displays Also Have Buttons That Point to Other PDI Files in the Group

The Details (Cont'd)



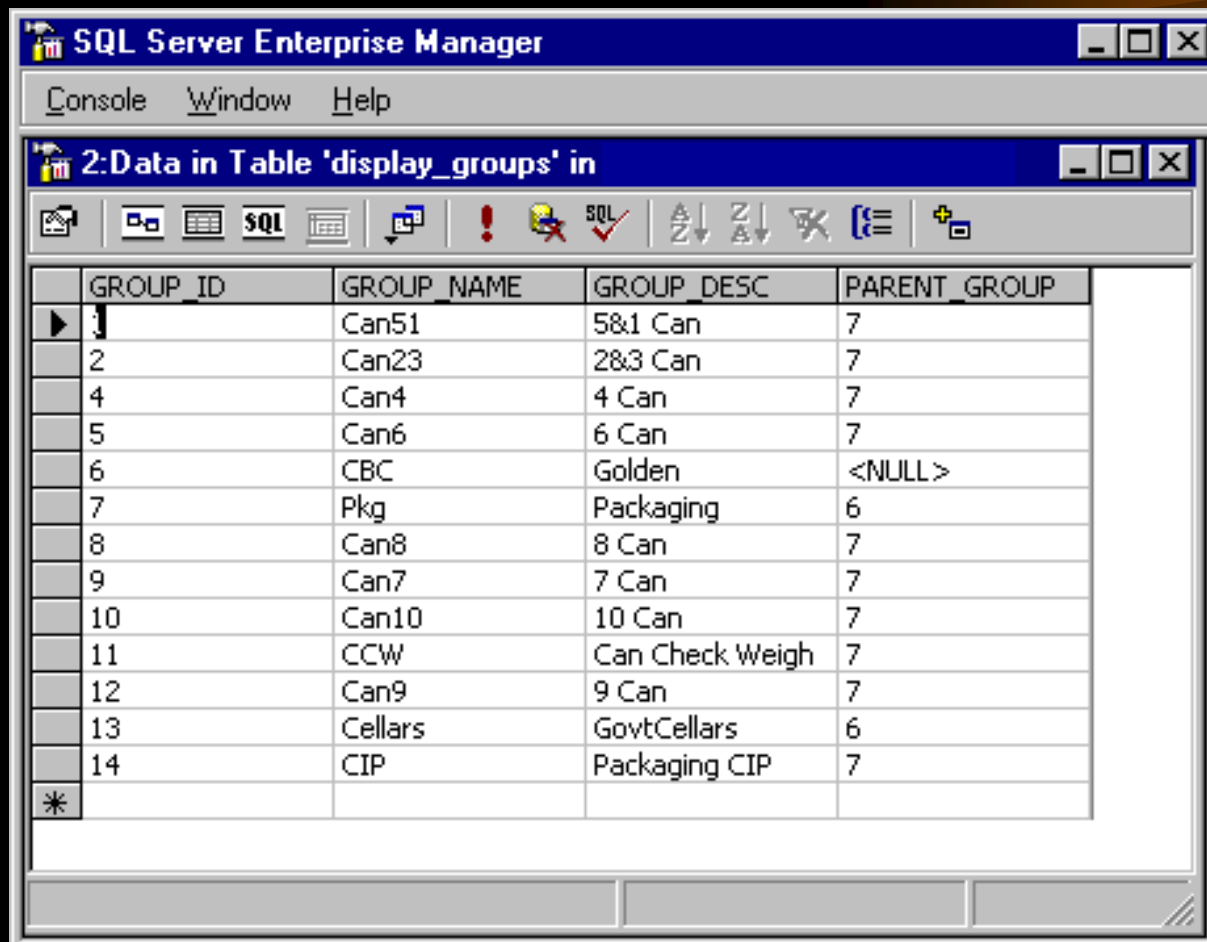
- We Initially Built a Fully Functional ActiveX Control Embedded into the Process Book Display
- For Ease of Deployment We Moved the ActiveX Code into VBA and Placed it in the Process Book Display

The Details (Cont'd)



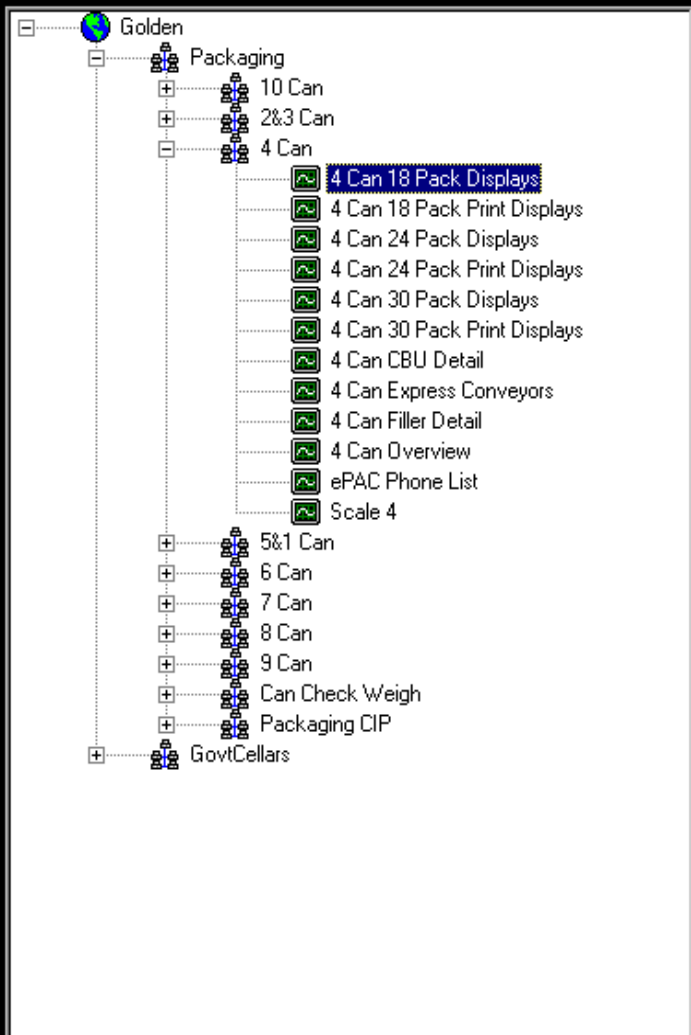
- Database Tables:
 - » Display_Groups Table - Defines Main Node and Branches
 - » Displays Table - Defines Node Description, Path to PDI Files, PIW Or Doc File, Branch to which it is attached, Type of File and File Name

display_groups Table



The screenshot shows the SQL Server Enterprise Manager interface. The main window displays the data for the 'display_groups' table. The table has five columns: GROUP_ID, GROUP_NAME, GROUP_DESC, and PARENT_GROUP. The data is as follows:

GROUP_ID	GROUP_NAME	GROUP_DESC	PARENT_GROUP
1	Can51	5&1 Can	7
2	Can23	2&3 Can	7
4	Can4	4 Can	7
5	Can6	6 Can	7
6	CBC	Golden	<NULL>
7	Pkg	Packaging	6
8	Can8	8 Can	7
9	Can7	7 Can	7
10	Can10	10 Can	7
11	CCW	Can Check Weigh	7
12	Can9	9 Can	7
13	Cellars	GovtCellars	6
14	CIP	Packaging CIP	7

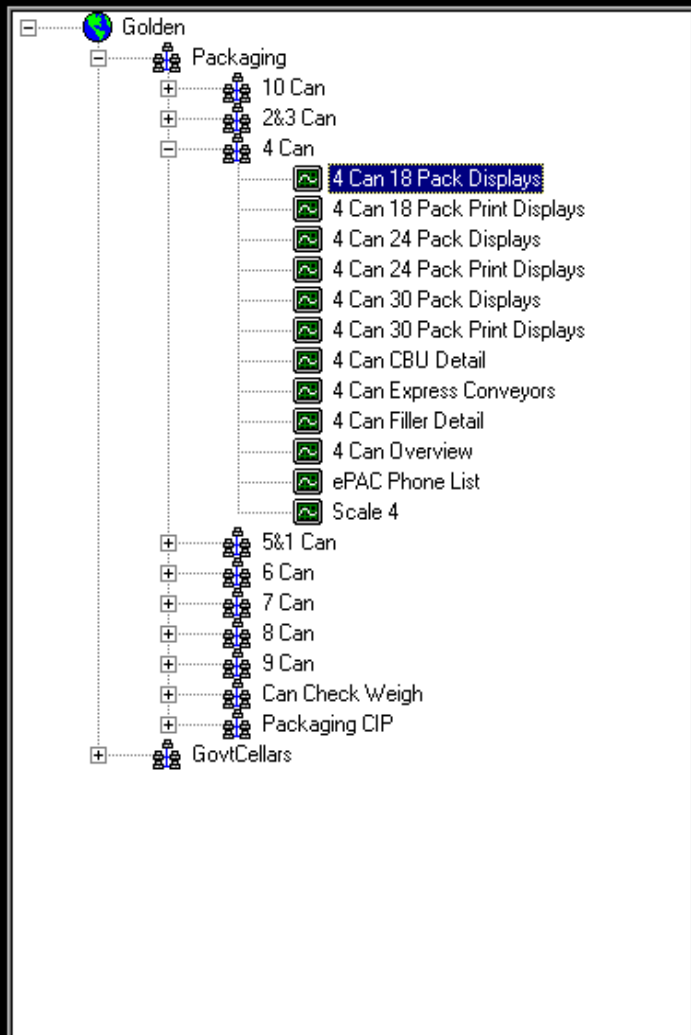


Packaging Display Menu

ePAC
Electronic Packaging at Coors

displays Table

DISPLAY_ID	DISPLAY_TYPE	DISPLAY_DESC	PATH	FILENAME	PIW_NAME	GROUP_ID
1	PDI	4 Can Overview	\\gon...	4CAN OVERVIEW.PDI	<NULL>	4
2	PDI	4 Can CBU Detail	\\gon...	4CAN CBU DETAIL.PDI	<NULL>	4
3	PDI	4 Can Express Conveyors	\\gon...	4CAN EXPRESS CONVEYORS.PDI	<NULL>	4
4	PDI	4 Can Filler Detail	\\gon...	4CAN FILLER DETAIL VIEW.PDI	<NULL>	4
5	PDI	4 Can 18 Pack Displays	\\gon...	4 CAN 18 PK.PDI	<NULL>	4
6	PDI	4 Can 24 Pack Displays	\\gon...	4 CAN 24 PK.PDI	<NULL>	4
7	PDI	4 Can 30 Pack Displays	\\gon...	4 CAN 30 PK.PDI	<NULL>	4
8	PDI	4 Can 18 Pack Print Displays	\\gon...	4 CAN 18 PK PRINT.PDI	<NULL>	4
9	PDI	4 Can 24 Pack Print Displays	\\gon...	4 CAN 24 PK PRINT.PDI	<NULL>	4
10	PDI	4 Can 30 Pack Print Displays	\\gon...	4 CAN 30 PK PRINT.PDI	<NULL>	4
11	PDI	6 Can Overview	\\gon...	6 Can Overview.PDI		5
12	PDI	6 Can CBU Detail	\\gon...	6 Can CBU Detail.PDI		5
13	PDI	6 Can UPL	\\gon...	6 Can UPL Detail.PDI		5
14	PDI	8 Can 18 Pack Displays	\\gon...	8 Can 18 PK.PDI	<NULL>	8
15	PDI	8 Can 24 Pack Displays	\\gon...	8 Can 24 PK.PDI	<NULL>	8
16	PDI	8 Can 30 Pack Displays	\\gon...	8 Can 30 PK.PDI	<NULL>	8
17	PDI	8 Can 18 Pack Print Displays	\\gon...	8 Can 18 PK PRINT.PDI	<NULL>	8
18	PDI	8 Can 24 Pack Print Displays	\\gon...	8 Can 24 PK PRINT.PDI	<NULL>	8
19	PDI	8 Can 30 Pack Print Displays	\\gon...	8 Can 30 PK PRINT.PDI	<NULL>	8
20	PDI	6 Can 12 Pack Displays	\\gon...	6 Can 12 PK.PDI	<NULL>	5
21	PDI	6 Can 12 Pack Print Displays	\\gon...	6 Can 12 PK PRINT.PDI	<NULL>	5
22	PDI	QC Monitor (all can lines)	\\gon...	QCMonitor.pdi	NULL	11
23	PDI	Scale 1	\\gon...	Scale1.pdi	NULL	1
24	PDI	Scale 5	\\gon...	Scale5.pdi	NULL	1
25	PDI	Scales 1&5	\\gon...	Scales15.pdi	NULL	1
26	PDI	Scale 2	\\gon...	Scale2.pdi	NULL	2
27	PDI	Scale 3	\\gon...	Scale3.pdi	NULL	2
28	PDI	Scales 2&3	\\gon...	Scales23.pdi	NULL	2
29	PDI	Scale 4	\\gon...	Scale4.pdi	NULL	4
30	PDI	Scale 6	\\gon...	Scale6.pdi	NULL	5

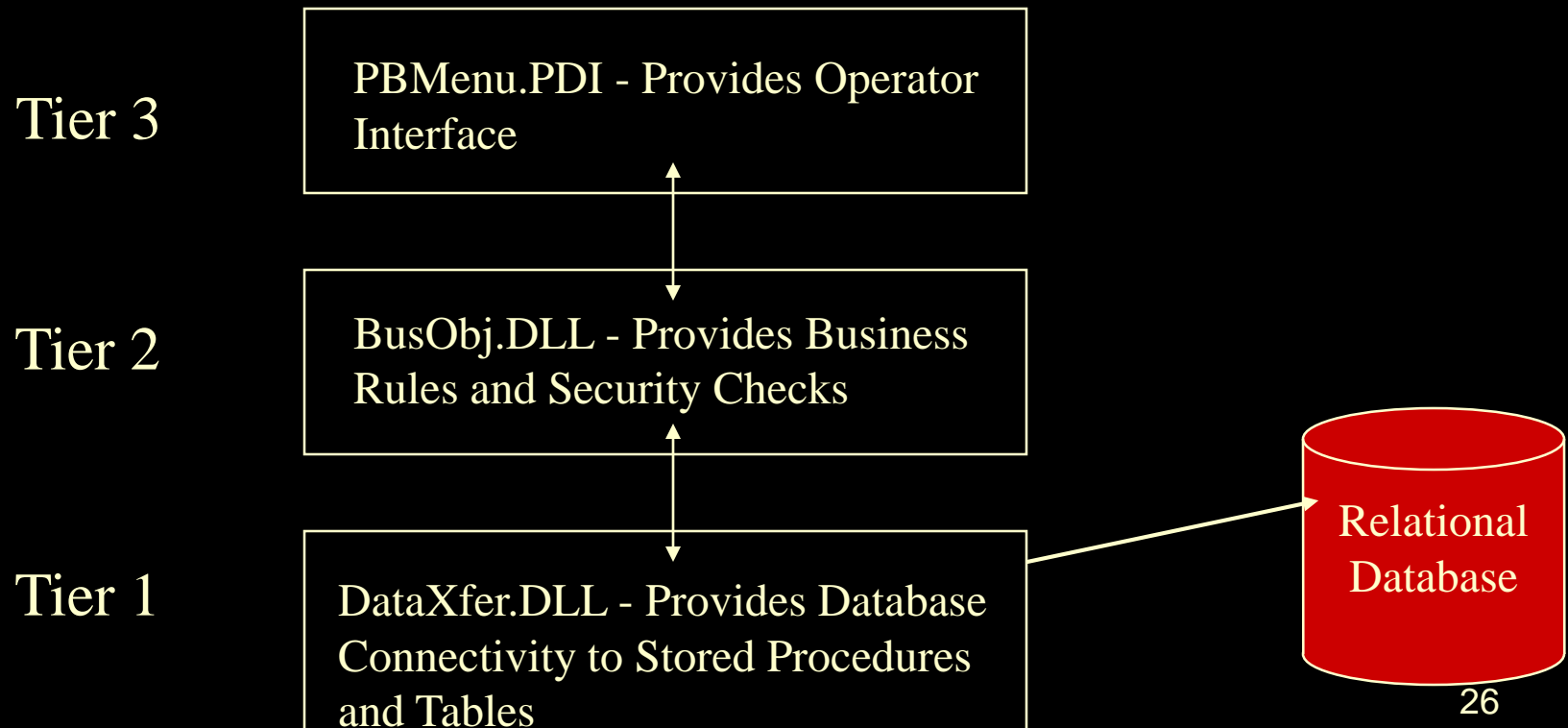


Packaging Display Menu

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Details (Cont'd)

- We Used Multi-Tier Architecture to Access Data From the SQL Server Database



The Details (Cont'd)



- Load Tree View Menu at Startup of Menu.PDI File - Database is Accessed Only Once
- Each Node of the Tree View Contains All Information Needed to Access the Displays (Path, Description, Filename and File Type)
- Click Event on Tree View Branch Opens File (PIW or PDI)

Conclusion



- PDI Files Easier to Maintain When Stored on Network Drive Instead of Locally
- Tree View Menu Provides Integration of all PDI Files in Each Production Area
- File Paths are Hidden From Operators
- Expandability is Achieved by Incorporating the 3 - Tier Architecture Approach

Questions???

