

The background features a blue-tinted image of a person's hands interacting with a tablet. Overlaid on this are various semi-transparent icons representing data management and analytics, including pie charts, bar graphs, a line graph with an upward arrow, a circular progress indicator showing 64%, and a hexagonal grid of icons. The main title is centered in a large, white, sans-serif font.

Future of Data Management Summit

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3S SOLIDWORKS

The background is a blue-tinted image of a person's hands interacting with a tablet. Overlaid on this are various technical and data-related graphics: a circular gauge showing 64%, a bar chart with an upward arrow, a large pie chart on the right, a grid of hexagons with icons, and several smaller circular gauges and icons. The overall theme is digital engineering and data analysis.

PDM API

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About Me

- SolidWorks + PDM > 10 year
- Mechanical + Mechatronics
- Designer 6 year
- CMS 5 year

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Agenda

PDM API Intro

DataCard++

Working With BOM data

Stand-Alone Tools

API Intro

- **A**pplication **P**rogramming Interface
- Programs talk to Each Other
- 'Digital Buttons'
- Why
 - Eliminate User Repetition
 - Reduce Errors
 - Extend Functionality
- Many Applications Have Them
 - SolidWorks, MS Office, Windows

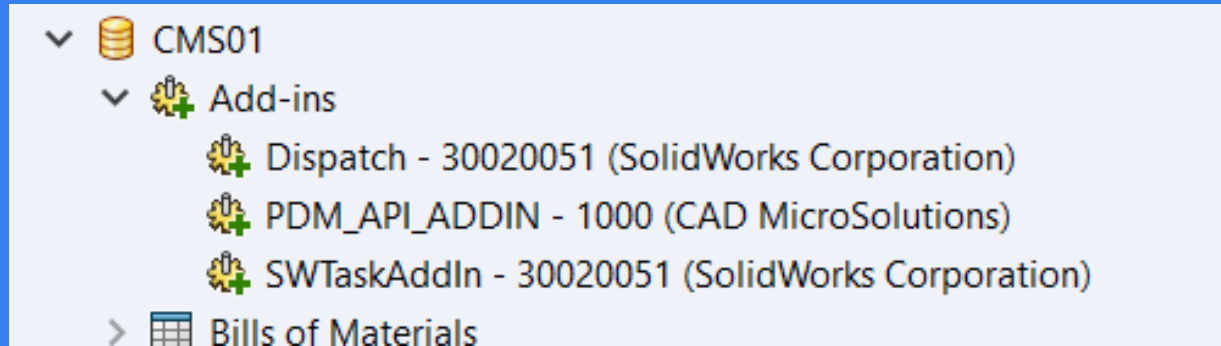


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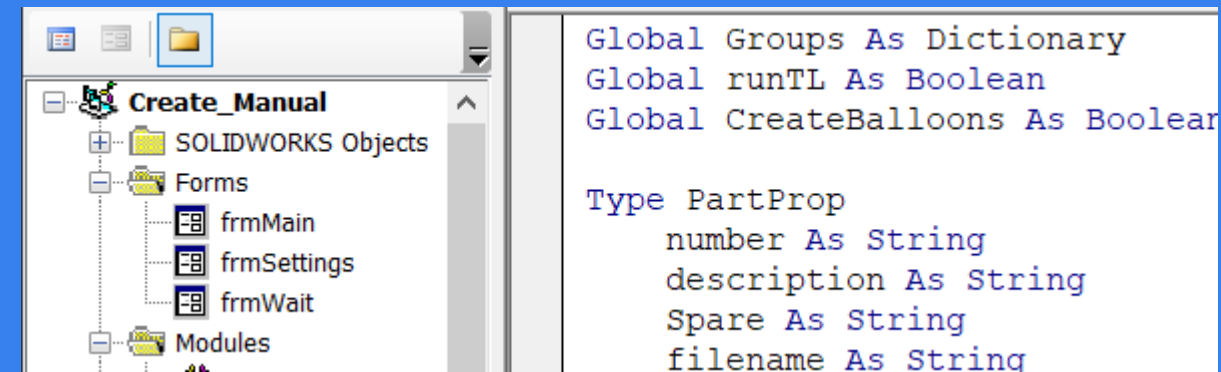
API Intro

Types

- PDM AddIn (dll)
 - easy to distribute
 - Integrated in PDM
- Standalone (exe)
 - non-user app
 - command line
- External
 - SW add-in / macro / other



PDM_Update_References.exe	8/16/2021 12:51 PM	Application	20 KB
PDM_UserImport.exe	6/25/2021 3:38 PM	Application	171 KB

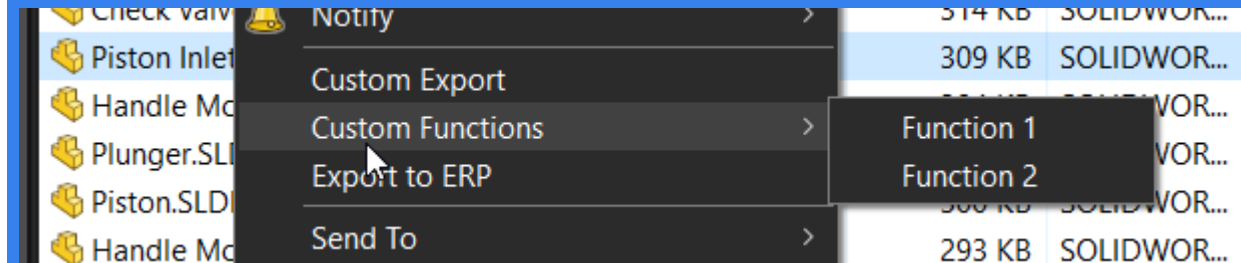
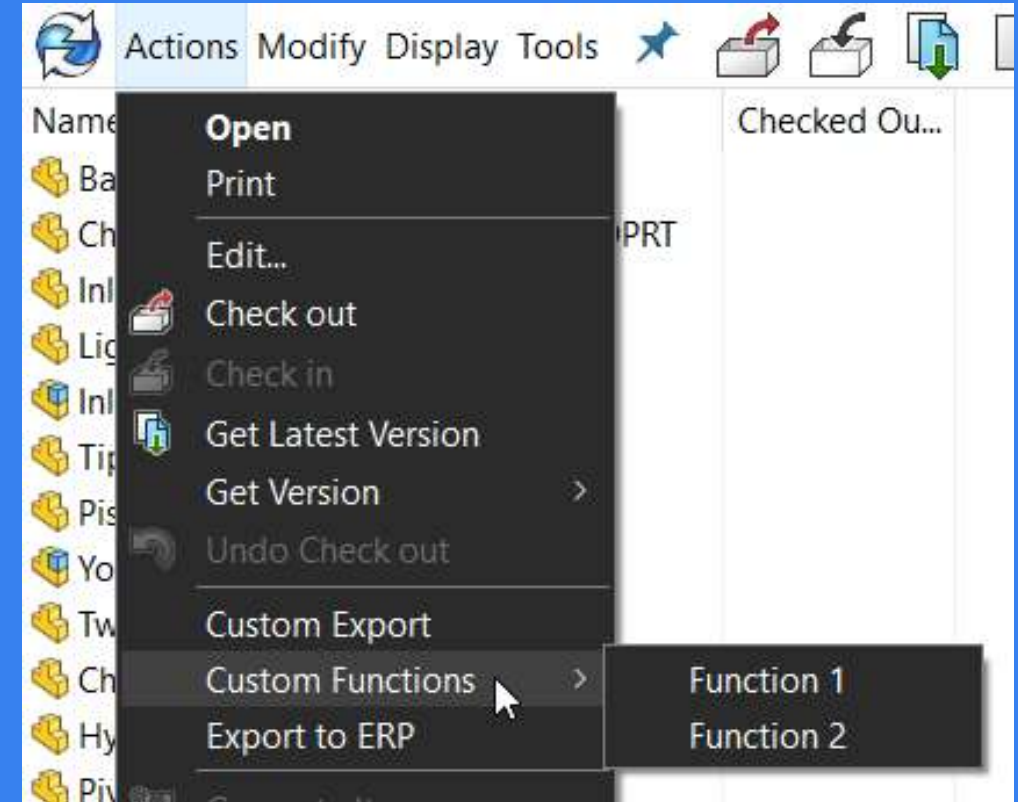


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API Intro

Typical Methods of Operation (AddIn)

- Custom Button in PDM UI
 - initiated by user
 - program told what to act on
 - program runs



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API Intro

Typical Methods of Operation (AddIn)

- Event trigger (hooks)
 - Check-in / out, File rename, State Change, etc
- Run automatically when triggered
- Can be used to:
 - Enforce Standardization
 - Validate User Input
 - Post process

EdmCmd_PreLock	3 = One or more files are about to b
EdmCmd_PreMove	21 = One or more files are about to
EdmCmd_PreMoveFolder	33 = One or more folders are about
EdmCmd_PreRename	15 = One or more files are about to
EdmCmd_PreRenameFolder	31 = One or more folders are about
EdmCmd_PreShare	17 = One or more files are about to
EdmCmd_PreState	9 = One or more files are about to h
EdmCmd_PreUndoLock	7 = One or more files are about to g
EdmCmd_PreUnlock	5 = One or more files are about to b
EdmCmd_SelectItem	55 = Item is selected in File Explore
EdmCmd_SerialNo	2 = The add-in should generate a ne
EdmCmd_TaskDetails	42 = Use this hook to add your own

EdmCmd_PostCopy	20 = One or more files were copied
EdmCmd_PostCopyFolder	36 = One or more folders were copie
EdmCmd_PostDelete	14 = One or more files have been de
EdmCmd_PostDeleteFolder	30 = One or more folders were delet
EdmCmd_PostGet	26 = One or more files were copied
EdmCmd_PostLabel	47 = A label has been created
EdmCmd_PostLabelAddItem	53 = A label has gotten a file or fold
EdmCmd_PostLabelDelete	49 = A label has been deleted
EdmCmd_PostLabelModify	51 = A label has been renamed or g
EdmCmd_PostLock	4 = One or more files have been che
EdmCmd_PostMove	22 = One or more files were moved



DataCard++

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DataCard++

Data Input Validation & Advanced Formula

- Validate DataCard data

Validation
(Text length)

☐ Min: 0

☐ Max: 0

Flags



Part Info Comments

Code: 123ABC

Description:

Part Number:

Created By:

Material:

Vendor:

Project Name:

Project Number:

BOM Quantity:

Revision:

Weight:

Family:

Cost:

Type: ☐ Purchased ☐ Built

SW

Generate PN

'Code' Field format must be: ###-AAAA

OK

Part Info Comments

Code: 524-CMSS

Description:

Part Number:

Created By: Admin

Material:

Vendor:

Project Name:

Project Number:

BOM Quantity:

Revision:

Weight:

Family:

Cost:

Type: ☐ Purchased ☐ Built

SW

Generate PN

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DataCard++

Data Input Validation & Advanced Formula

- Restrict Input based on condition(s)

The screenshot displays the 'DataCard++' application interface. On the left, a 'Part Info' form is visible with the following fields: Code (524-CMSS), Description, Part Number, Created By (Admin), Material, Vendor, Project Name, and Project Number. A modal dialog box is overlaid on the form, displaying the message: 'Cost and Vendor fields may only be modified by an Admin.' with an 'OK' button. The form also includes a 'Cost' field (1), a 'Type' section with radio buttons for 'Purchased' and 'Built', and a 'Current State' section with a 'Checked out by' field (System Administrator). The application logo, a red cube with 'SW' and a yellow cube, is located at the bottom center of the form.

DataCard++

Data Input Validation & Advanced Formula

- Advanced Formula Logic (dependent fields)

Product Type	Product Code	MakeBuy	Duration	Ship Size
Chair	CH	Make	1 DAY	MEDIUM
Sofa	SF	Make	3 DAY	LARGE
Seat	SE	Buy	1 DAY	SMALL
Switch	SW	Buy	0.5 DAY	SMALL
Table	TB	Make	2 DAY	LARGE

Details

Product Type:

Product Code:

Make / Buy: ☐ Buy ☒ Make

Duration:

Ship Size:

Details

Product Type:

Product Code:

Make / Buy: ☐ Buy ☒ Make

Duration:

Ship Size:

Details

Product Type:

Product Code:

Make / Buy: ☒ Buy ☐ Make

Duration:

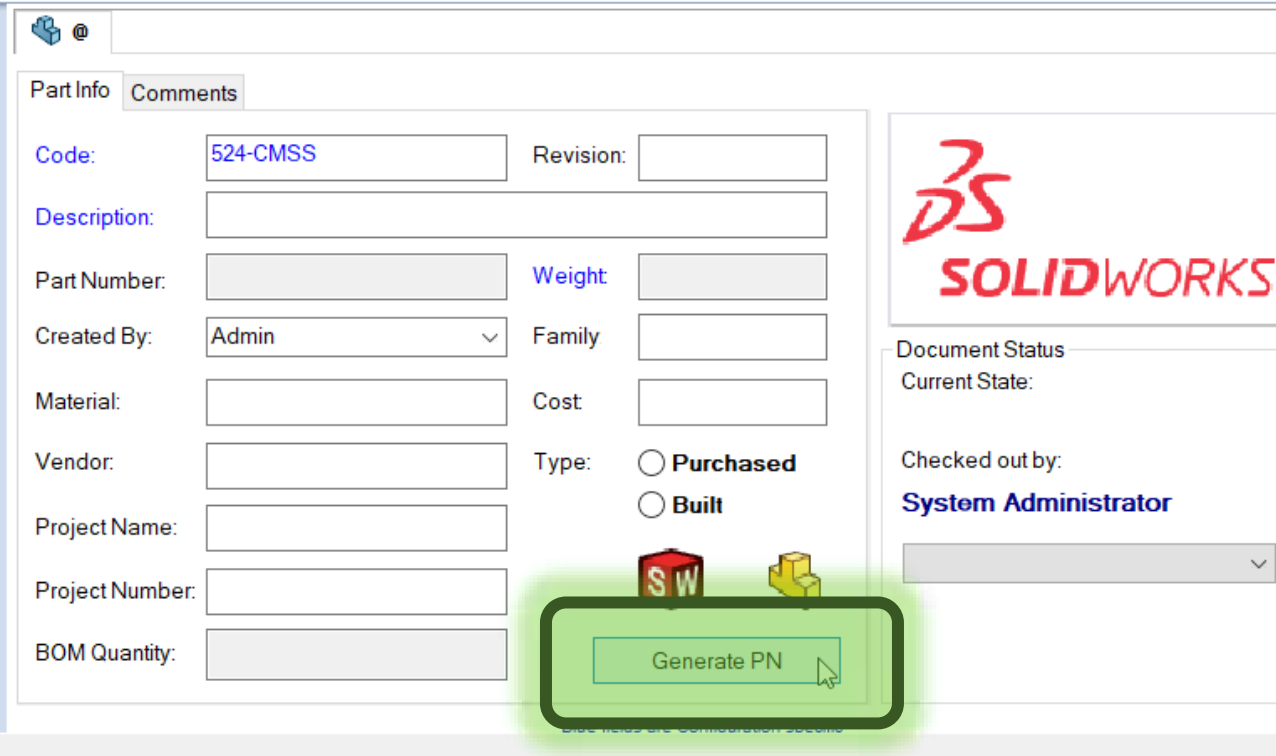
Ship Size:

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DataCard++

Advanced DataCard Interface + Logic

- Button on DataCard to Run Program
- Action:
 - Launch Custom UI
 - Validate UI
 - Pull Data from external source



The screenshot displays the DataCard++ interface, which is a custom UI for SolidWorks. It features a 'Part Info' tab with various input fields for part details. The 'Code' field is populated with '524-CMSS'. Other fields include 'Revision', 'Description', 'Part Number', 'Weight', 'Created By' (set to 'Admin'), 'Family', 'Material', 'Cost', 'Vendor', 'Type' (with radio buttons for 'Purchased' and 'Built'), 'Project Name', 'Project Number', and 'BOM Quantity'. A 'Generate PN' button is highlighted with a green box and a mouse cursor. The interface also includes a 'Comments' tab and a 'Document Status' section on the right, showing the 'Current State' and 'Checked out by' (System Administrator). The SolidWorks logo is visible in the top right corner.

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DataCard++

Advanced DataCard Interface + Logic

- Launch Custom UI
- Advanced Form Logic
 - Validate Inputs
 - External Data Look-up
 - Multiple drop-down dependencies
- Dynamic UI

FAMILY	Field 1	Field 2
A	Combo,2,0,Tools Description,Pic1	Text,2,1,OD or T
	Dowel Pin	
	O-Ring	
	crew with Dog Point	
	Split Pin	
	Punch Backing	
B	Combo,2,0,Tools Description,Pic1	Text,2,1,OD or THREA
	Cut-Off Ejector	
	Cut-Off Filler	
	Cut-Off Quill Insert	
	Cut-Off Knife Insert	

Part Number Generator

Family: A

Tools Description: SD Screw with Dog Point

OD or THREAD or Diam d2 (##-#): 2

ID / Dia dp (##-#): 1.5

LENGTH / Thickness T/Dia d1 (##-#): 3

Part Number: ASD020015030

Update

Technical drawing showing dimensions: OD, L, L dp, Ø dp.

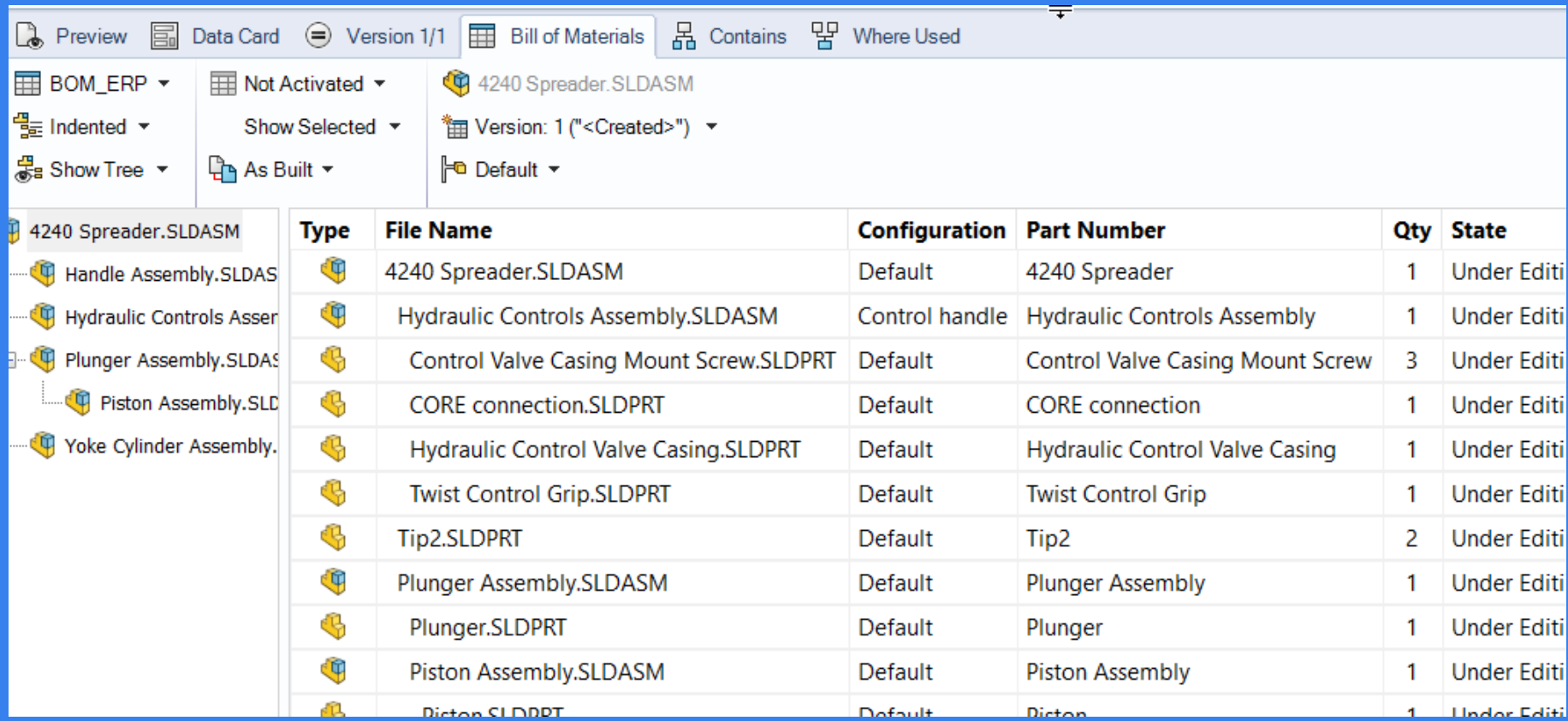
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The background features a blue-tinted image of a person's hands interacting with a tablet. Overlaid on this are various technical and data-related graphics: a circular gauge showing 64%, a bar chart with an upward arrow, a large circular radar chart, a hexagonal grid of icons, and several smaller circular progress indicators. The overall theme is digital engineering and data management.

Working With BOM Data

ERP, MRP Integration

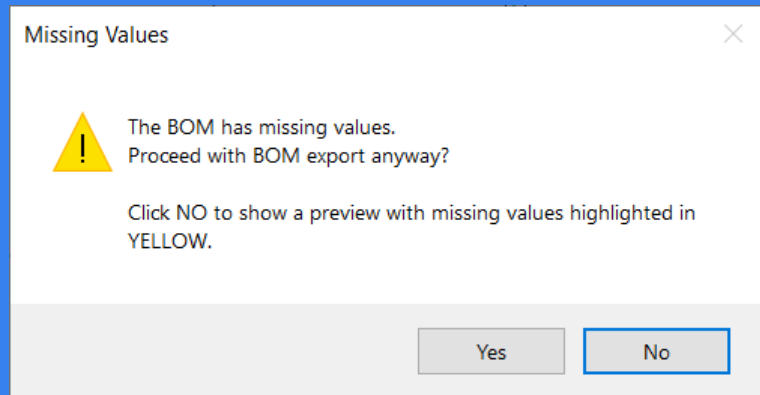
- Pull BOM data from PDM / SW BOM



Type	File Name	Configuration	Part Number	Qty	State
	4240 Spreader.SLDASM	Default	4240 Spreader	1	Under Editi
	Hydraulic Controls Asser	Control handle	Hydraulic Controls Assembly	1	Under Editi
	Control Valve Casing Mount Screw.SLDPRT	Default	Control Valve Casing Mount Screw	3	Under Editi
	CORE connection.SLDPRT	Default	CORE connection	1	Under Editi
	Hydraulic Control Valve Casing.SLDPRT	Default	Hydraulic Control Valve Casing	1	Under Editi
	Twist Control Grip.SLDPRT	Default	Twist Control Grip	1	Under Editi
	Tip2.SLDPRT	Default	Tip2	2	Under Editi
	Plunger Assembly.SLDASM	Default	Plunger Assembly	1	Under Editi
	Plunger.SLDPRT	Default	Plunger	1	Under Editi
	Piston Assembly.SLDASM	Default	Piston Assembly	1	Under Editi
	Piston.SLDPRT	Default	Piston	1	Under Editi

ERP, MRP Integration

- Validate Data
 - Missing Values (based on line item type)
 - Present 'fix it' report to user



Level	Number	Cost	Material	Weight	Part Number
1	170.012.800	758.36		1065.1	Hydraulic Control
1.1	170.012.605	.87	Alloy Steel	3.30	Control Valve Ca
1.2	170-012-106	887.00	Alloy Steel	941.00	CORE connector
1.3		87.88	ABS		Hydraulic Control
1.4		163.47	PA Type 6	74.3	Twist Control Gri
2	170-012-007	113.54	AISI 4140 Steel, normalized	1201.390	Tip2
3	170.012.860	287.98		1945.16	Plunger Assembly
3.1	170.012.904		Plain Carbon Steel	1594.0	Plunger
3.2	170.012.819			351.16	Piston Assembly
3.2.1	170.012.852	142.39	7022-T6		Piston
4	H02-035-542	16.47	Cast Alloy Steel	119.43	Tip Pin
5	170-012-010	50.21	AISI 4142 Alloy Steel	380.24	Arm Pivot Pin
6		387.14		1132.31	Default
6.1	170.012.610	153.61	AISI 4340 Steel, annealed	887.52	Formed
6.2	170.012.815	48.11	Material <not specified>	3.28	Light Assembly
6.3	170.012.706	1.04	Plain Carbon Steel	9.01	Handle Mounting
6.4	170.012.703	31.25	Alloy Steel	34.01	Handle Battery C
6.5	C-02197		Nylon 6/10	31.76	BatteryHousing

ERP, MRP Integration

- 'Message' Data

- Filter out line items (irrelevant, grouped, type)
- Insert additional line items
- Roll-up quantities

- Export to CSV

```
Level,Top Assembly,Number,Part Number,Qty,Description,Revisi
1,170.012.000,170.012.000,4240 Spreader,1,4240 SPREADER,,120
1.1,170.012.000,170.012.800,Hydraulic Controls Assembly,1,HY
1.1.1,170.012.000,170.012.605,Control Valve Casing Mount Scr
1.1.2,170.012.000,170-012-106,CORE connection,1,CORE CONNECT
1.1.3,170.012.000,170.012.801,Hydraulic Control Valve Casing
1.1.4,170.012.000,170.012.760,Twist Control Grip,1,TWIST CON
1.2,170.012.000,170-012-007,Tip2,2,SPREADER TIP,,113.54,"AIS
1.3,170.012.000,170.012.860,Plunger Assembly,1,PLUNGER ASSEM
1.3.1,170.012.000,170.012.904,Plunger,1,PLUNGER,,113.58,Plai
1.3.2,170.012.000,170.012.819,Piston Assembly,1,PISTON ASSEM
1.3.2.1,170.012.000,170.012.852,Piston,1,ZUIGER PISTON,,142.
1.4,170.012.000,H02-035-542,Tip Pin,1,TIP PIN,,16.47,Cast Al
1.5,170.012.000,170-012-010,Arm Pivot Pin,2,ARM PIVOT PIN,a,
1.6,170.012.000,170.012.700,Default,1,HANDLE ASSEMBLY,,387.1
```

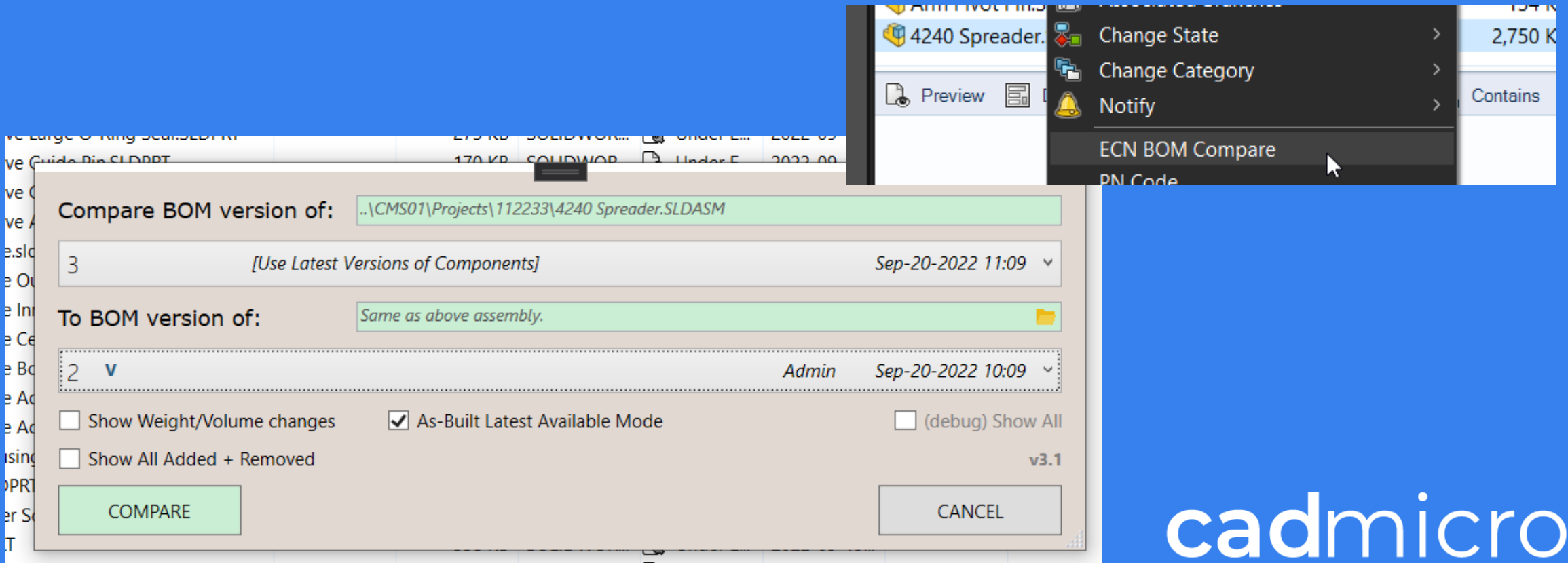
ERP, MRP Integration

- Notify 3rd Party Application
- Log Exports

Success	ExportTy...	PDMuname	Assem Number	JobNr	RevNr	DateLOC	i...	S...	L...	M...	note1
1	FIN	System Administrator	170.012.000	33243	2	2019-11-14 10:20:35.960	1	0	0	0	Export Complete
1	FIN	System Administrator	170.012.000	33243	3	2019-11-14 10:29:38.687	1	0	0	0	Export Complete
1	FIN	System Administrator	170.012.000	33243	4	2019-11-14 10:33:22.217	1	0	0	0	Export Complete
1	FIN	System Administrator	170.012.000	33243	5	2019-11-14 10:36:02.840	1	0	0	0	Export Complete
1	FIN	System Administrator	170.012.000	33243	6	2019-11-14 11:09:27.167	1	0	0	0	Export Complete
0	MAT	System Administrator	152.066.000	33243	NULL	2019-11-21 16:33:44.930	1	0	0	0	ABORT: create o
0	MAT	System Administrator	152.066.000	33243	NULL	2019-11-21 16:35:18.583	0	0	0	0	UI CANCEL: dete
1	MAT	System Administrator	152.066.000	33243	1	2019-11-21 16:40:53.603	0	0	0	0	Export Complete
0	MAT	System Administrator	152.066.000	33243	NULL	2019-11-21 16:47:30.417	N..	0	0	0	FirstExport Missir
0	MAT	System Administrator	152.066.000	33243	NULL	2019-11-21 17:14:13.790	N..	0	0	0	FirstExport Missir
1	MAT	System Administrator	152.066.000	33243	1	2019-11-21 17:19:49.973	0	0	0	0	Export Complete
1	FIN	System Administrator	152.066.000	33243	1	2019-11-21 17:21:37.607	0	0	0	2	Export Complete

BOM Comparison (ECN)

- Compare PDM Computed BOMs
- Custom UI to select versions / assemblies



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BOM Comparison (ECN)

- Computed PDM BOMs parsed + Compared
- Custom Comparison Rules
- Formatted Output

cadmicro		Engineering Change Notice						ECN3522	
Part Number		170-012-000				Date		9/15/2022	
New Revision		B1				By		A.TOTEV	
Previous Revision		A2				Reason		Increase Spreader Output	
Affected Part Numbers									
PART NUMBER	DESCRIPTION	NEW REV	Δ QTY	CHANGE DETAILS	STOCK	VER (OLD)	REV (OLD)	QTY (OLD)	WEIGHT (OLD)
170-012-000	4240 SPREADER	_latest		Revision		3 (2)	_latest ()	1	18081.04 (16237.15)
170-012-007	SPREADER TIP		+2	Qty		1		4 (2)	1201.390
170.012.770	YOKE CYLINDER			Weight		2 (1)		1	2431.86 (2990.75)
170.012.750	O-RING	A	+1	Added		1 ()	a ()	1 ()	1.6 ()
170.012.751	WASHER TEFLON		+1	Added		1 ()		1 ()	2.1 ()
170.012.752	WASHER - TEFLON		+1	Added		1 ()		1 ()	3.93 ()
170.012.755	STOP RING		-1	Removed		(1)		(1)	(497.03)
170.012.892	RETURN TUBE		-1	Removed		(1)		(1)	(69.53)



Stand-Alone Application

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Bulk User Import

- Console Application. Admin Only.

LOGIN	NAME	INITIAL	EMAIL	GROUP_A	GROUP_B	GROUP_C	GROUP_
RBooker	Rachel Booker	RB	RBooker@acme.com	Mechanical			
LGrey	Laura Grey	LG	LGrey@acme.com	Mechanical		Admin	Librarian
CJohnson	Craig Johnson	CJ	CJohnson@acme.com	Mechanical			
MJenkins	Mary Jenkins	MJ	MJenkins@acme.com	Mechanical			
JSmith	Jamie Smith	JS	JSmith@acme.com	Mechanical	Manager	Admin	

```
C:\Users\Alex\Documents\PdmUserImport - Source\PdmUserIm...
info: PdmUserImport.Library.PdmApiService[0] Vault not logged in, logging in.
warn: PdmUserImport.Library.PdmApiService[0] Group name 'Mechanical' does not exist, creating group.
info: PdmUserImport.Console.Program[0] User login 'RBooker' was added to groups: Mechanical ,
warn: PdmUserImport.Library.PdmApiService[0] Group name 'Admin' does not exist, creating group.
warn: PdmUserImport.Library.PdmApiService[0] Group name 'Librarian' does not exist, creating group.
info: PdmUserImport.Console.Program[0] User login 'LGrey' was added to groups: Mechanical ,Admin ,Librarian ,
info: PdmUserImport.Console.Program[0] User login 'CJohnson' was added to groups: Mechanical ,
info: PdmUserImport.Console.Program[0] User login 'MJenkins' was added to groups: Mechanical ,
warn: PdmUserImport.Library.PdmApiService[0] Group name 'Manager' does not exist, creating group.
info: PdmUserImport.Console.Program[0] User login 'JSmith' was added to groups: Mechanical ,Manager ,Admin ,
```

Users + Groups Info

- User Management.

```
C:\Users\Alex\Documents\PDM_Console_App\PDM_console_app\PDM_console_a...
Group: Mechanical
  Read
  Lock
  Rename
  Rename
  ShowWorkingVersion
  AddFolder
  AddFolder
Group: Admin
  Read
  Lock
  Delete
  Rename
  Rename
  DeleteFolder
  DestroyTrash
  ShowWorkingVersion
  Rollback
  MoveFile
  MoveFolder
  AddFolder
  AddFolder
Group: Librarian
  Share
  DestroyTrash
  Rollback
Group: Manager
  RemActivate
```

```
C:\Users\Alex\Documents\PDM_Console_App\PDM_console_app\PDM_console_a...
Group: Mechanical
  User: Rachel Booker      ; RBooker      ; RB ; RBooker@acme.com
  User: Laura Grey        ; LGrey        ; LG ; LGrey@acme.com
  User: Craig Johnson     ; CJohnson    ; CJ ; CJohnson@acme.com
  User: Mary Jenkins      ; MJenkins     ; MJ ; MJenkins@acme.com
  User: Jamie Smith       ; JSmith       ; JS ; JSmith@acme.com
Group: Admin
  User: Laura Grey        ; LGrey        ; LG ; LGrey@acme.com
  User: Jamie Smith       ; JSmith       ; JS ; JSmith@acme.com
Group: Librarian
  User: Laura Grey        ; LGrey        ; LG ; LGrey@acme.com
Group: Manager
  User: Jamie Smith       ; JSmith       ; JS ; JSmith@acme.com
-
```


Client Vault Info

- Admin Tool: List info on Local Vault Views

```
C:\Users\Alex\Documents\PDM_console_app\bin\Debug\PDM_consol...  
List Of PDM Vaults:  
Name: API  
  Local Path: C:\API  
  View ID: {02645169-B277-4632-A483-CD683E47D789}  
  Vault ID: {6D6E265E-D027-4661-84B1-0C78212A7055}  
  Logged In: 0  
Name: CMS  
  Local Path: C:\CMS  
  View ID: {AD777C2A-845D-4884-BAC2-9CD19104B013}  
  Vault ID: {3B9936B7-D18C-48C1-9B46-30C682657A8E}  
  Logged In: 0  
Name: CMS01  
  Local Path: C:\CMS01  
  View ID: {7A19DF06-9818-42E7-8BD6-AE1367251AE9}  
  Vault ID: {315E2B73-84EC-4D7C-8023-5C63F020C20F}  
  Logged In: -1  
Name: DemoPDM  
  Local Path: C:\DemoPDM  
  View ID: {D5689532-02FD-4C7F-B828-C7DB16C6A173}  
  Vault ID: {E94AD390-258D-4245-BD67-E5F963E0BDB1}  
  Logged In: 0
```

Client Vault Info

- Admin Tool: Local PDM Client Log

```
C:\Users\Alex\Documents\PDM_console_app\PDM_console_a...
Get Client PDM LOG? (Y)
Y

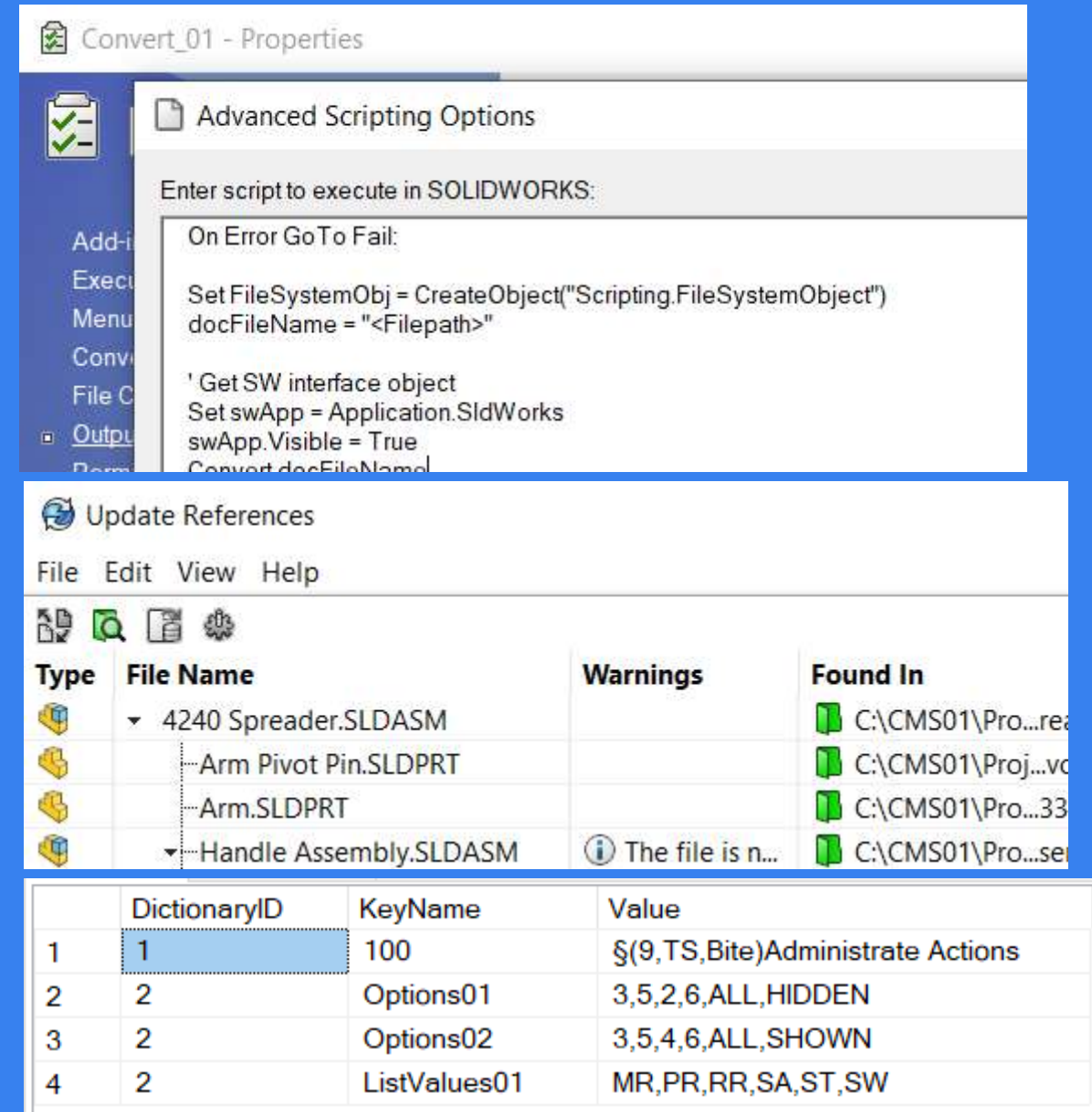
Client LOG:
Date: 2020-10-14 18:12:02.180
Module: Explorer.EXE
Function: CShellView::mhRemoveBNSubscription
Code: 0x80080005
Code Description: Server execution failed
Error adding notification subscription.

Date: 2020-10-14 18:12:02.300
Module: Explorer.EXE
Function: CShellView::mhRemoveBNSubscription
Code: 0x80080005
Code Description: Server execution failed
Error adding notification subscription.

Date: 2020-10-15 10:56:41.223
Module: EdmServer.exe
Function: EdmServerApp::myEnableBackupPrivilege
```

Additional Examples

- PDM Tasks
 - Modify Script
 - PDM Task AddIn
- Bulk Update References Tool
- Check-In Reminder
- PDM Database Dictionaries



Convert_01 - Properties

Advanced Scripting Options

Enter script to execute in SOLIDWORKS:

```
On Error GoTo Fail:

Set FileSystemObj = CreateObject("Scripting.FileSystemObject")
docFileName = "<Filepath>"

' Get SW interface object
Set swApp = Application.SldWorks
swApp.Visible = True
Convert docFileName
```

Update References

File Edit View Help

Type	File Name	Warnings	Found In
Assembly	4240 Spreader.SLDASM		C:\CMS01\Pro...rea
Part	Arm Pivot Pin.SLDPRT		C:\CMS01\Proj...vc
Part	Arm.SLDPRT		C:\CMS01\Pro...33
Assembly	Handle Assembly.SLDASM	The file is n...	C:\CMS01\Pro...se

	DictionaryID	KeyName	Value
1	1	100	\$(9,TS,Bite)Administrate Actions
2	2	Options01	3,5,2,6,ALL,HIDDEN
3	2	Options02	3,5,4,6,ALL,SHOWN
4	2	ListValues01	MR,PR,RR,SA,ST,SW

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Questions?

...

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