Autodesk®

Productstream™
connect

Integrating Autodesk® Productstream™ with Enterprise Applications

White Paper
Fall 2007

Summary

The Autodesk® Productstream™ family of data management solutions provides a modular and practical approach to controlling and maximizing an organization's investment in design data. Contributing to this functionality is Productstream's tight integrations with such design automation tools as AutoCAD, Mechanical Desktop, and Inventor. As a result, Productstream can serve as the single touch point between drawings, parts and/or bill information and the organization's various enterprise applications.

To bridge the gap between Productstream and the enterprise, Productstream Connect (PScnt) facilitates the data exchange "gateway" between Productstream and other enterprise applications. With PScnt, organizations can exchange product or part data, actual design files, and renditions. As a result, organizations will realize such benefits as reduced cost of quality, improved design reuse and reduced cost of ownership.

This white paper addresses how PScnt bridges Productstream with enterprise applications. Specific topics include an overview of PScnt, benefits, operations and implementation guidelines. These guidelines will examine processes in the context of data initialization, change controls, and various records management and regulatory requirements.

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Summary

In today's manufacturing environment, accelerating the product development process is critical to staying ahead of the competition. Supporting these lifecycle activities will include various product applications and data repositories. These systems can comprise a wide variety of enterprise applications such as requirements management, electronic content management (ECM), product life cycle management (PLM), and ERP solutions. A component of process improvements will no doubt include the need to move and/or share data throughout the product lifecycle.

The Autodesk® Productstream™ family of data management solutions provides a modular and practical approach to controlling and maximizing an organization's investment in design data. Contributing to this functionality is Productstream's tight integrations with such design automation tools as AutoCAD, Mechanical Desktop, and Inventor. As a result, Productstream can serve as the single touch point between drawings, parts and/or bill information and the organization's various enterprise applications.

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Productstream and the Enterprise

The product life cycle for most any manufacturing-oriented organization typically follows common phases. Depending on the nature of the product, these phases can include requirements definition, design and engineering, manufacturing, outsourcing and product maintenance and/or support. Support for these various phases come in the form of specific vertical software solutions that can include requirements management, CAD, product data/lifecycle management (PDM/PLM), electronic contact management (ECM) and ERP systems. Clearly, there are others. However, product data is inherently defined and maintained across these multiple systems and in most cases operate independently of each other. The diagram below illustrates this concept.

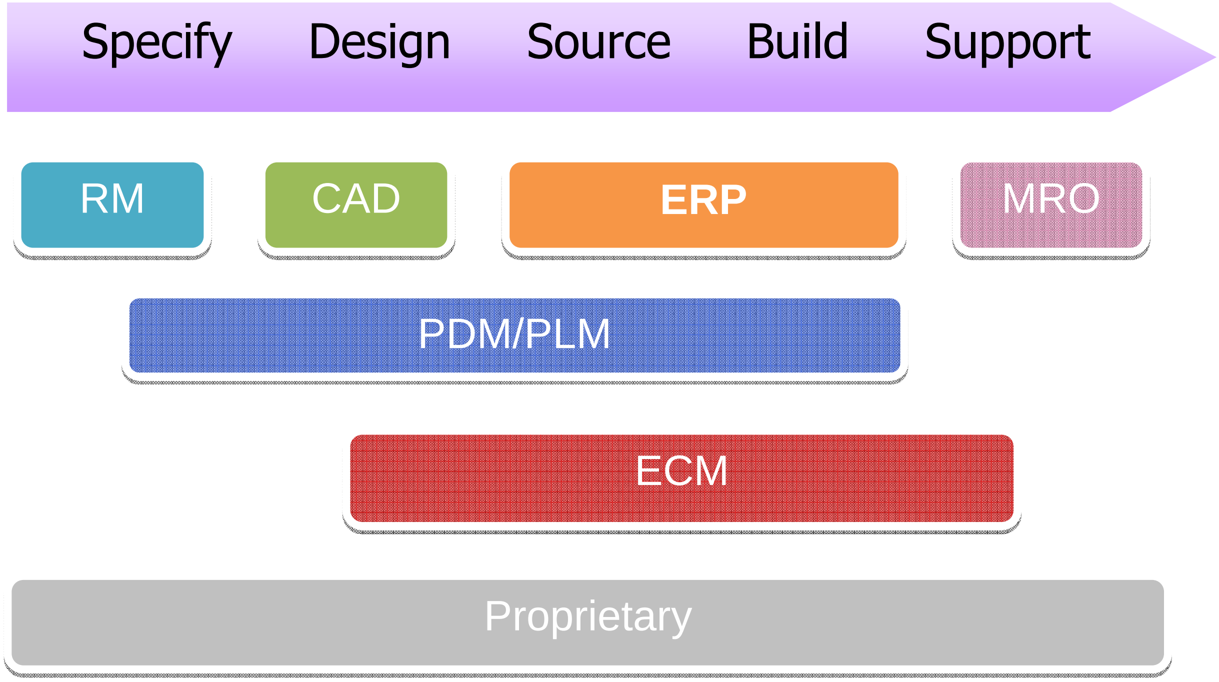


Figure 1
Product Lifecycle Applications

The nature of product and/or part data can include bills, metadata (attributes), parametrics, as well as files, attachments and renditions. Metadata can include everything from the product name, description, vendor, unit measure, etc. Parameters typically imply operating characteristics and/or conditions such as power, speed, temperatures, etc. Additionally, various documents, such as specifications, drawings, test results, manufacturing and inspection procedures, etc., provide further detail regarding the product and/or part.

Productstream represents one of the various applications that can exist within and facilitate portions of the product life cycle. Productstream is specifically designed to support Autodesk's design automation tools, such as AutoCAD, Mechanical Desktop and Inventor. As a result, Productstream is ideally suited to serve as the single touch point for data created and derived by these various design automation tools as well as additional product and/or part information created by users and various processes such as change control cycles.

What is Productstream Connect?

To bridge the gap between Productstream and the enterprise, PScnt facilitates the data exchange "gateway" between Productstream and other enterprise applications. This platform is based on Microsoft's .NET technology and utilizes a combination of client and server based software components. Data and/or files can be exchanged either automatically or via user initiated "push" options. The system's services oriented architecture is designed to scale and provide a flexible approach in its ability to connect with a wide variety of enterprise applications such as electronic content management (ECM), requirements management, product life cycle management (PLM), and ERP solutions.

How can Productstream Connect be Used?

Data integration applications with Productstream can be considered in the context of four primary “use cases”. These include:

- Data migration and initialization
- Change management
- Release
- Regulatory requirements

These use cases will dictate the nature of how data is exchanged. Furthermore, they are critical to developing an implementation and deployment roadmap.

The figure below illustrates these use cases and the flow of data.

<table>
<tr><th rowspan="2">Application and Use Case</th><th colspan="2">Nature of Data Exchange</th><th rowspan="2">Typical Applications</th><th rowspan="2">Data Typically Transferred</th></tr>
<tr><th>PS</th><th>App</th></tr>
<tr><td>Migration and Initialization</td><td colspan="2">←</td><td>Various</td><td>Items, bills, files and renditions</td></tr>
<tr><td>Engineering Change</td><td colspan="2">↔</td><td>PLM</td><td>Change data, items, bills, files and renditions</td></tr>
<tr><td>Release</td><td colspan="2">→</td><td>ECM and ERP</td><td>Items, bills, files and renditions</td></tr>
<tr><td>Regulatory</td><td colspan="2">↔</td><td>ECM</td><td>Item and renditions</td></tr>
</table>

Figure 2
Data Exchange Applications and Use Cases

Highlights of each use case are discussed below. It should be noted that for the purposes of illustration, references are made to various applications such as ECM, PLM and ERP. However, it is recognized that organizations will no doubt have other types of applications in use.

Data Migration and Initialization

Data migration and initialization is concerned with the idea of populating the Productstream environment with existing product and/or part data that resides elsewhere. These repositories can include simple file system subdirectory schemes, spreadsheets, “home grown” databases or applications such as ERP and PLM solutions.

These existing repositories contain data and/or files that are intended to be managed in Productstream. As a result of this “use case”, data is typically extracted, possibly manipulated and than transferred to Productstream. This transaction is one-way and typically will not require data to be sent back to the source repository.

As part of this type of transaction, the source data is “mapped” to the appropriate fields or attributes of Productstream. This mapping process may include manipulating the source data before being written to Productstream. Examples of this preprocessing can include parsing path names into attributes, separating the part and version numbers used to name a drawing file, and even extracting title block information from a drawing and mapping to attributes setup in Productstream.

Change Management

It can be argued that change management is the heart of the design/engineering process … and with significant ramifications upstream. A product bill of materials may be comprised of various parts. These parts can include mechanical, electrical, commodity, etc. Moreover, these parts may leverage various applications to author and edit associated data such as CAD files, specifications, art and labels, etc. As a result, Productstream may be an important “node” in an overall change cycle initiated and managed in another enterprise solution (most often PLM solutions).

With Productstream as a node in the EC cycle, bidirectional data exchange will be the nature of the integration. Highlights of this exchange will include, EC information being transmitted to Productstream and resultant data transmitted back. In this scenario, the EC will be the primary “carrier”. Part, bills and/or drawings are attachments to the process. Hence this type of transaction will inherently be different from what might be used for a data migration exercise.

Release

Reflecting the latest state of a part and its data is a requirement for various enterprise solutions. The most common of these target applications can include electronic content management (ECM) repositories and enterprise resource planning (ERP) system.

ECM solutions tend to be document or file centric. Although a part may be designed in Inventor and maintained in Productstream, an organization may be interested in only the released rendition of the actual part. This use case will have some parallels with the regulatory use case and is further addressed in the section below.

In the same way that change management might be viewed as the heart of the engineering process, ERP systems can be viewed as the heart of business solutions for the enterprise. For the manufacturing organization, the ERP solution maintains the item master and/or bills. Nomenclature will vary, but the item master is the primary part or product.

The item master moreover, represents that nature of how a part is bought and/or made. Therefore, supplying data related to the latest version of an item in a timely fashion is critical. Productstream may be a source of this information for various parts.

In this "use case", released item data will typically be supplied by the various authoring/edit applications within an enterprise. As a result, an integration between Productstream and an ERP solution would be characterized by a one-way transfer of data. This data can include the released item data and potentially CAD drawings and/or renditions thereof.

Regulatory Requirements

The regulatory/records management process is an extension of the release process with functions related to various regulations administrated by such agencies as the FDA and OSHA. Special operations would require the ability to treat transaction logs, archival collections, retention phases, and digital rights management.

Depending on the industry, various regulatory requirements may be imposed by such agencies as the FDA and OSHA. This use case is similar in nature to the release use case previously addressed. However, depending on the regulatory requirement, special operations may require the ability to treat transaction logs, archival collections, retention phases, and digital management rights.

As previously suggested, the release process will transmit the approved state of an item. This transfer can include both data and files. The implications of regulatory requirements imply that specific operations must now be accommodated. For example, a special operation might require that certain data and/or files be removed after a given period of time. This "maintenance" functionality is the domain of the target application. As a result, this use case must support the transfer of data to Productstream. Invariably, a bidirectional exchange of data will ultimately be required of this use case.

How can it Benefit your Organization?

As a data exchange solution to other enterprise applications, PScnt will help organizations realize the following benefits:

- reduce total cost of ownership by establishing Productstream and its associated design automation tools as a single point of contact for the enterprise processes
- reduces cost-of-quality via accurate and timely transfers of data to other enterprise applications
- accelerate deployment of Productstream via the ability to support bulk import and loading capabilities

Manufacturing oriented organizations often have multiple design automation tools. These tools can include mechanical, electrical, and even software (firmware) development solutions. Accessing and/or exchanging data from these tools have included such techniques as direct point-to-point, enterprise application integration (EAI) hub and spoke, and even data warehousing approaches. Each has their own challenges. As noted earlier, Productstream supports the complete span of Autodesk's design automation tools. As a result, Productstream can serve as a single point of contact for these tools within enterprise processes. This in turn reduces the total cost of ownership by eliminating application specific integration development, maintenance and support costs, Studies abound that speak to the cost-of-quality associated with manual data entry and/or routing of data. Various analysis literally link the number of keystrokes with the volume of data, the distance of transfer, and time of transfer to a geometric increase in errors … which ultimately increases an organization's cost-of-quality. With PScnt, data and/or attachments can be exchanged immediately and transparently.

As previously suggested, Productstream co-exists with other applications. Productstream is a recipient and/or originator of data and/or drawings. In the majority of cases, preexisting data will exist when implementing Productstream. In anticipation of this, PScnt has the facilities to support bulk import, loading and synchronization of items, bills and/or attachments.

Ultimately quantifying these benefits may be important for your organization. Provided in the Implementation Guidelines section below is additional information addressing return on investment (ROI) methods and considerations.

Feature Highlights

Noteworthy features of PScnt include:

- the ability to support the transfer of any and all data
- provide users with the option to "intentionally push" data to a connected application
- support the transfer of data transparently and automatically
- provide users with the ability to review data before it is written to a target application
- honor existing access rights of both the Productstream and the connected application
- permit system administrators to define how data is mapped from Productstream to a target application or visa versa.
- transaction error alerting, messaging and recovery
- access to transaction logs and error detection behavior

PScnt supports the transfer of all Productstream items, bills and attachments to a connected application. How this data is transferred depends on what the connected application can accept. The PScnt mapping and configuration tools facilitate this functionality as addressed further in the next section.

Users have two primary options for transferring data. One option is to "intentionally push" data to a connected application. This option is based on the user's specific actions to setup a transfer job. This setup includes the ability to specify priority, alerting, and data formats.

A second option allows data and/or attachments to be transferred transparently and automatically. The transfer would occur as an embedded operation within a process such as a change control process. In this example, a final item release may conclude a change approval. Upon this approval, the transfer details are automatically setup and submitted to the PScnt application.

Prior to the transfer of data to a target application, users have the option to preview the data for final approval. Once approved, the transfer can be activated. Alternatively, the user has the option to cancel the transaction. This activity is conducted by an “administrator” level.

A critical part of any data transfer is to ensure that the user initiating and/or approving the action has the rights to do so. PScnt honors existing access rights of both the Productstream and the connected application. Implementation considerations include addressing any single-sign-on (SSO) and other authentication schemes.

The schema and processes of a connected application will most likely differ from that of Productstream. In order to support the transfer of data, a mapping between the two systems must be established. PScnt facilitates this mapping via XML formatted data and includes consideration for an “n-to-n” attributes assignments. Moreover, users have the ability to define how data item creation, edits and removals are treated.

During the transfer operation, provisions exist to detect and message error conditions. Error recover options can include automatic termination and multiple user-defined retries. Error alerting includes email options.

All transactions are recorded and can be reviewed. Transaction data includes such characteristics as date/time, initiating user, data items, and transfer status.

Solution Components

The diagram below illustrates the primary solution components of PScnt.

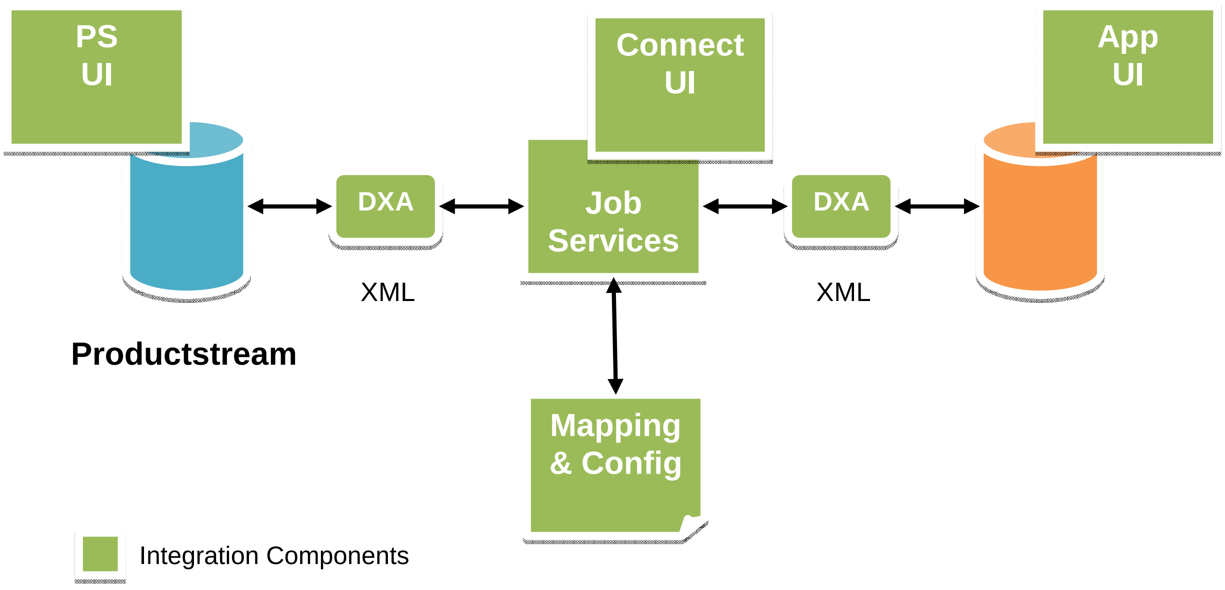


Figure 3
Productstream Connect Solution Components

The components of PScnt include:

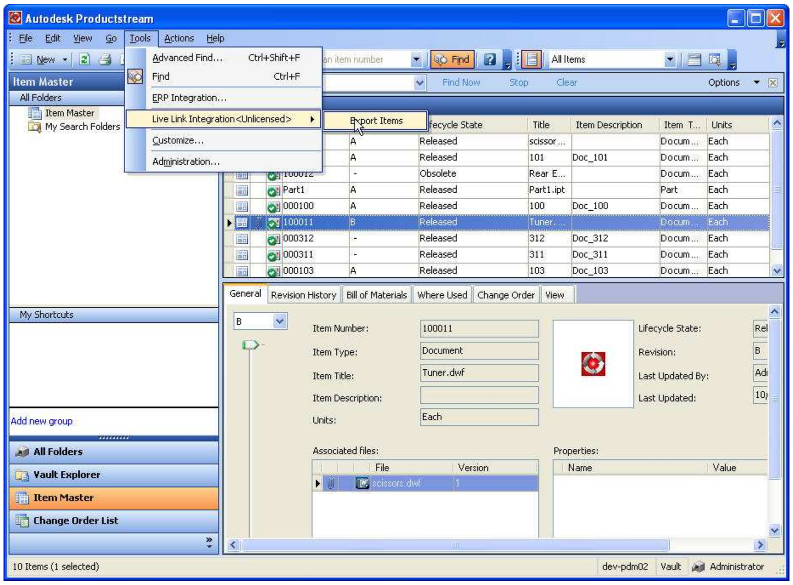
- client user interface
- Data Exchange Adapters (DXA)
- Job Services module
- mapping and configuration tables

Each of these is further addressed below.

Client User Interface

The PScnt architecture supports the ability to exchange data either automatically or manually. As a result, PScnt maintains a specific application footprint in the form of a user interface and API hooks that link to the DXA. The next couple of diagrams illustrate an example user interface and the transfer of data from Productstream to Open Text's Livelink.

The diagram below illustrates the activation of PScnt from within Productstream. Users can select the items directly from within Productstream and activate the transfer dialog.



		fecycle State	Title	Item Description	Item T...	Units
	A	Released	scissor ...		Docum ...	Each
	A	Released	101	Doc_101	Docum ...	Each
100012	-	Obsolete	Rear E...		Docum ...	Each
Part1	A	Released	Part1.ipt		Part	Each
000100	A	Released	100	Doc_100	Docum ...	Each
100011	B	Released	Tuner. ...		Docum ...	Each
000312	-	Released	312	Doc_312	Docum ...	Each
000311	-	Released	311	Doc_311	Docum ...	Each
000103	A	Released	103	Doc_103	Docum ...	Each

B

Item Number: 100011

Item Type: Document

Item Title: Tuner.dwf

Item Description:

Units: Each

Lifecycle State: Rel

Revision: B

Last Updated By: Adı

Last Updated: 10/

Associated files:

File	Version
scissors.dwf	1

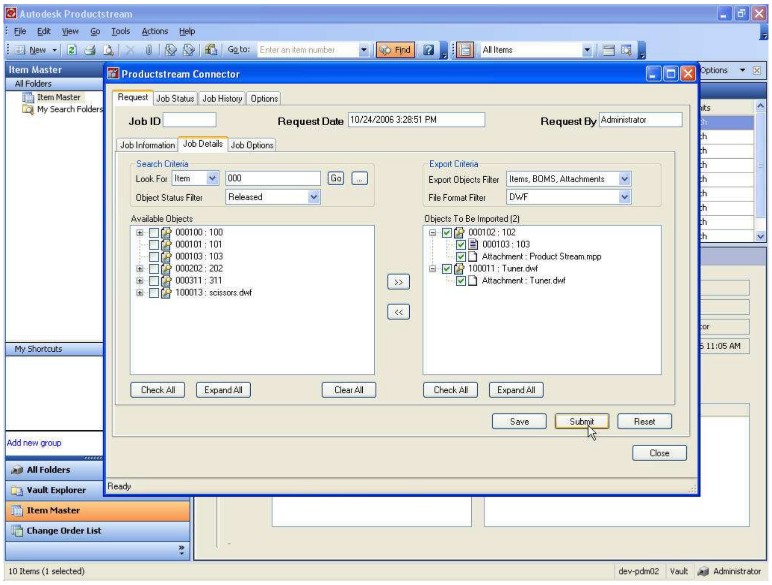
Properties:

Name	Value

10 Items (1 selected) dev-pdm02 Vault Administrator

Figure 4
PScnt User Interface
Item Selection and Job Transfer Initiation

The PScnt job dialog permits users to further detail what items are transferred. A sample is shown in the image below.



Job ID

Request Date 10/24/2006 3:28:51 PM

Request By Administrator

Look For Item 000

Object Status Filter Released

Export Objects Filter Items, BOMS, Attachments

File Format Filter DWF

Available Objects
- ☐ 000100 : 100
- ☐ 000101 : 101
- ☐ 000103 : 103
- ☐ 000202 : 202
- ☐ 000311 : 311
- ☐ 100013 : scissors.dwf

Objects To Be Imported (2)
- ☑ 000102 : 102
  - ☑ 000103 : 103
  - ☑ Attachment : Product Stream.mpp
- ☑ 100011 : Tuner.dwf
  - ☑ Attachment : Tuner.dwf

Ready

10 Items (1 selected) dev-pdm02 Vault Administrator

Figure 5
PScnt User Interface
Job Setup and Item Filtering

Fundamentally, the user interface is a “data collection dialog” that ultimately parses and processes the selected data and passes it onto the DXA via an API. As previously stated, an organization can embed this API within other processes (e.g. change process) to support the automated and transparent transfer of data to the DXA.

Data Exchange Adapter (DXA)

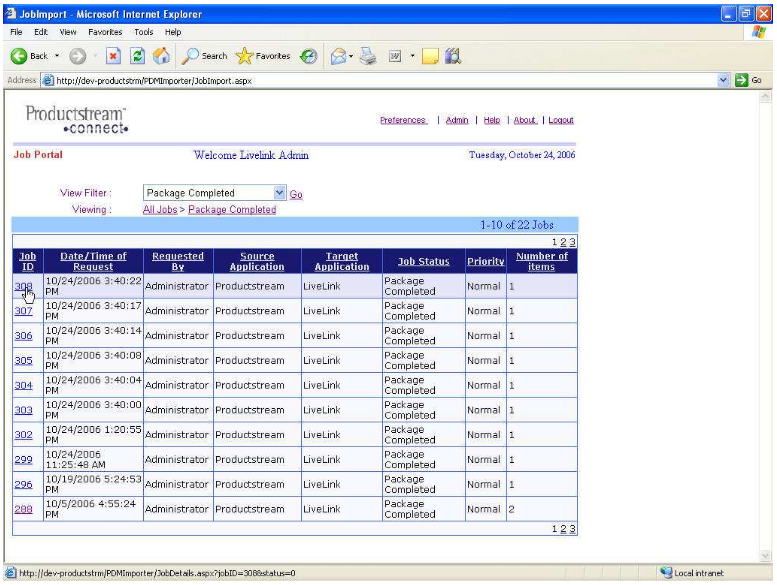
The DXA is a combination of application specific functionality and connects each application to the job services module. For example, the Productstream DXA will leverage Productstream and vault specific API calls in order to retrieve and/or write data from/to Productstream. The DXA for the connected application would in turn incorporate application specific functionality. However, the functions of the DXA and how data is passed to/from the job server module is well prescribed and the same for any connected application. This common interface description leverages XML and allows Productstream to be readily connected to various applications.

Job Services Module

The core of PScnt is the job services module. This module is actually comprised of three sub components. These components include:

- job services administrator
- supporting data base
- configuration and mapping files

The job services module permits users with administrator rights to view, activate and access status of various data exchange jobs. This user interface is available via a browser. A sample screen image is shown below.


JobImport - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://dev-productstrm/PDMImporter/JobImport.aspx
Go
Productstream™ •connect•
Preferences | Admin | Help | About | Logout
Job Portal
Welcome Livelink Admin
Tuesday, October 24, 2006
http://dev-productstrm/PDMImporter/JobDetails.aspx?jobID=308&status=0
Local intranet

View Filter : Package Completed Go
Viewing : All Jobs > Package Completed

1-10 of 22 Jobs

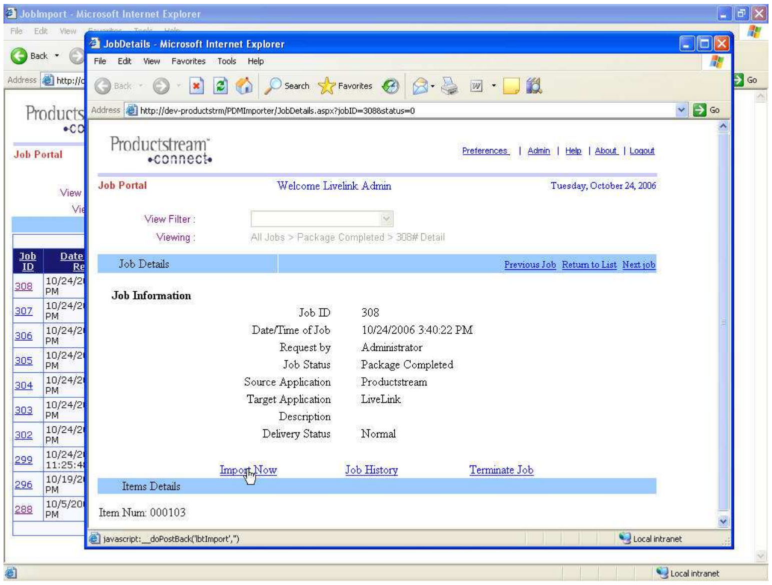
1 2 3

Job ID	Date/Time of Request	Requested By	Source Application	Target Application	Job Status	Priority	Number of items
308	10/24/2006 3:40:22 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
307	10/24/2006 3:40:17 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
306	10/24/2006 3:40:14 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
305	10/24/2006 3:40:08 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
304	10/24/2006 3:40:04 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
303	10/24/2006 3:40:00 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
302	10/24/2006 1:20:55 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
299	10/24/2006 11:25:48 AM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
296	10/19/2006 5:24:53 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	1
288	10/5/2006 4:55:24 PM	Administrator	Productstream	LiveLink	Package Completed	Normal	2

1 2 3

Figure 6
PScnt Job Server Browser Based User Interface
Job Selection, Activation and Status View

From within the Job Server user interface, specific job details can be accessed. As illustrated in the sample screen below, users can preview, activate, review history, and terminate a job.


JobDetails - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://dev-productstrm/PDMImporter/JobDetails.aspx?jobID=308&status=0
Go
Productstream™ •connect•
Preferences | Admin | Help | About | Logout
Job Portal
Welcome Livelink Admin
Tuesday, October 24, 2006
Previous Job Return to List Next job
Import Now
Job History
Terminate Job
javascript:__doPostBack('lbtImport','')
Local intranet

View Filter :
Viewing : All Jobs > Package Completed > 308# Detail

Job Details

Job Information

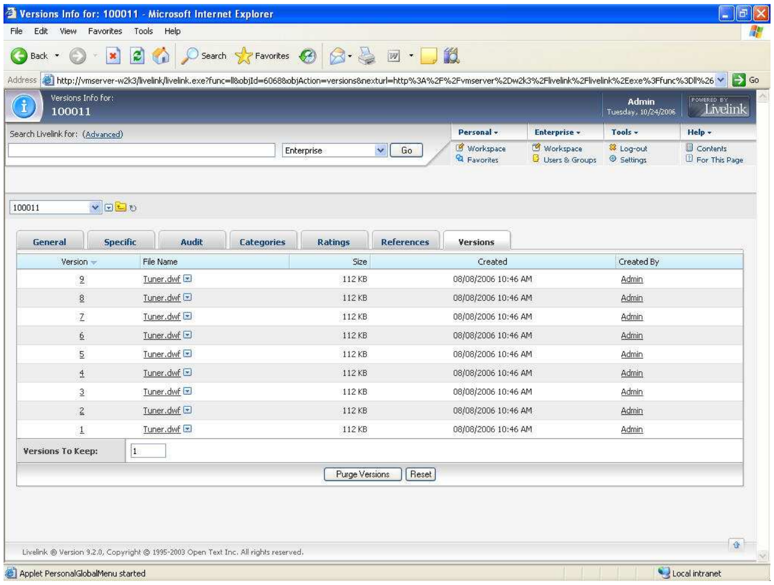
Job ID	308
Date/Time of Job	10/24/2006 3:40:22 PM
Request by	Administrator
Job Status	Package Completed
Source Application	Productstream
Target Application	LiveLink
Description	
Delivery Status	Normal

Items Details

Item Num: 000103

Figure 7
PScnt Job Server Browser Based User Interface
Job Selection, Activation and Status View

The final stage of the transfer sequence is the receipt of the data by the target applications. In the sample case, Open Text's Livelink is used and is shown below.



http://vmserver-w2k3/livelink/livelink.exe?func=ll&objId=6068&objAction=versions&nexturl=http%3A%2F%2Fvmserver%2Dw2k3%2Flivelink%2Flivelink%2Eexe%3Ffunc%3Dll%26

100011

Version	File Name	Size	Created	Created By
9	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
8	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
7	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
6	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
5	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
4	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
3	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
2	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin
1	Tuner.dwf	112 KB	08/08/2006 10:46 AM	Admin

Versions To Keep: 1

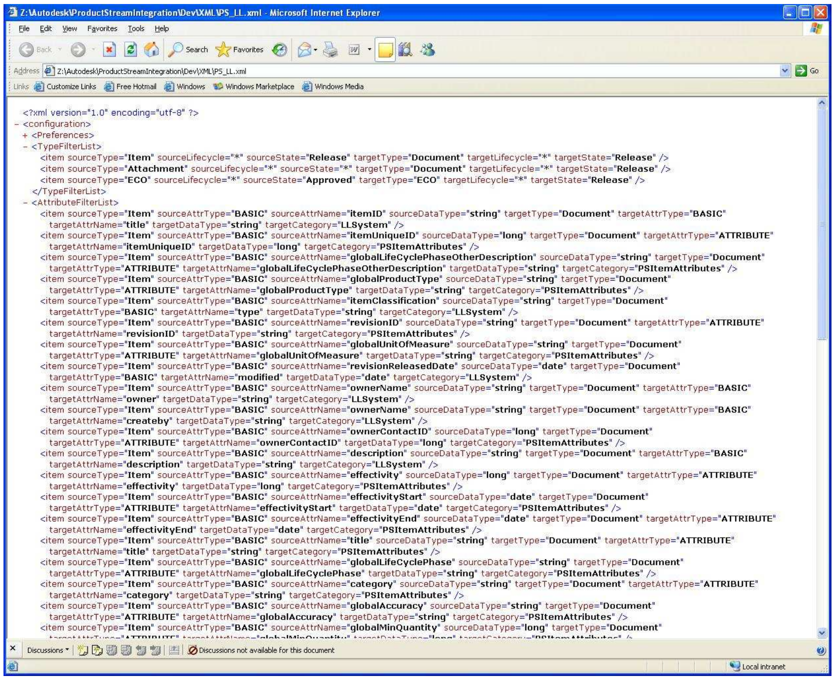
Livelink ® Version 9.2.0, Copyright © 1995-2003 Open Text Inc. All rights reserved.

Figure 8
Sample Screen of Open Text Livelink and Transferred Data/Drawings (DWF)
(Note version increments)

Mapping and Configuration Tables

Part of PScnt's flexibility is derived from the administrator-accessible mapping and configuration tables. These tables define how data is mapped from one environment to another, as well as how data is treated and/or manipulated. Several predefined templates are in place to accelerate the mapping assignments of data for such applications as electronic content management (ECM) systems as Open Text's Livelink, and product lifecycle management (PLM) systems such as Agile, MatrixOne, SmarTeam and TeamCenter Engineering.

XML is the standard transport protocol. The table below illustrates a sample mapping between Productstream and Open Text's Livelink.


Z:\Autodesk\ProductStreamIntegration\Dev\XML\PS_LL.xml - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address Z:\Autodesk\ProductStreamIntegration\Dev\XML\PS_LL.xml
Go
Links Customize Links Free Hotmail Windows Windows Marketplace Windows Media
Discussions
Discussions not available for this document
Local intranet

```
  <?xml version="1.0" encoding="utf-8" ?>
- <configuration>
  + <Preferences>
  - <TypeFilterList>
      <item sourceType="Item" sourceLifecycle="*" sourceState="Release" targetType="Document" targetLifecycle="*" targetState="Release" />
      <item sourceType="Attachment" sourceLifecycle="*" sourceState="*" targetType="Document" targetLifecycle="*" targetState="Release" />
      <item sourceType="ECO" sourceLifecycle="*" sourceState="Approved" targetType="ECO" targetLifecycle="*" targetState="Release" />
    </TypeFilterList>
  - <AttributeFilterList>
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="itemID" sourceDataType="string" targetType="Document" targetAttrType="BASIC"
        targetAttrName="title" targetDataType="string" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="itemUniqueID" sourceDataType="long" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="itemUniqueID" targetDataType="long" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalLifeCyclePhaseOtherDescription" sourceDataType="string" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalLifeCyclePhaseOtherDescription" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalProductType" sourceDataType="string" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalProductType" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="itemClassification" sourceDataType="string" targetType="Document"
        targetAttrType="BASIC" targetAttrName="type" targetDataType="string" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="revisionID" sourceDataType="string" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="revisionID" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalUnitOfMeasure" sourceDataType="string" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalUnitOfMeasure" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="revisionReleasedDate" sourceDataType="date" targetType="Document"
        targetAttrType="BASIC" targetAttrName="modified" targetDataType="date" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="ownerName" sourceDataType="string" targetType="Document" targetAttrType="BASIC"
        targetAttrName="owner" targetDataType="string" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="ownerName" sourceDataType="string" targetType="Document" targetAttrType="BASIC"
        targetAttrName="createby" targetDataType="string" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="ownerContactID" sourceDataType="long" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="ownerContactID" targetDataType="long" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="description" sourceDataType="string" targetType="Document" targetAttrType="BASIC"
        targetAttrName="description" targetDataType="string" targetCategory="LLSystem" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="effectivity" sourceDataType="long" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="effectivity" targetDataType="long" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="effectivityStart" sourceDataType="date" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="effectivityStart" targetDataType="date" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="effectivityEnd" sourceDataType="date" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="effectivityEnd" targetDataType="date" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="title" sourceDataType="string" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="title" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalLifeCyclePhase" sourceDataType="string" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalLifeCyclePhase" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="category" sourceDataType="string" targetType="Document" targetAttrType="ATTRIBUTE"
        targetAttrName="category" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalAccuracy" sourceDataType="string" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalAccuracy" targetDataType="string" targetCategory="PSItemAttributes" />
      <item sourceType="Item" sourceAttrType="BASIC" sourceAttrName="globalMinQuantity" sourceDataType="long" targetType="Document"
        targetAttrType="ATTRIBUTE" targetAttrName="globalMinQuantity" targetDataType="long" targetCategory="PSItemAttributes" />
```

Figure 9
Sample XML Mapping File
Data Exchange Between Productstream and Open Text's Livelink

System Requirements

Server

- Server2003
- MS SQL Server 2000 (SP3 or higher)
- .NET framework 1.1; ASP.NET (enable in the setup); IIS 5 or higher
- Memory/Storage – same as specified for Productstream

Client

- Same environment as specified for Productstream

How to Get There?

As previously addressed, there are fundamentally four (4) key “use cases” that will drive how an integration with Productstream would be established. These four are:

- Data migration and initialization
- Change management
- Release
- Regulatory requirements

The implementation guidelines addressed below focus on these use cases. General implementation guidelines such as requirements definition, prototyping, training, etc. are left to other sources that may include your own organization’s conventions and methods.

Components of an implementation effort with PScnt will include the following activities:

- Cost benefit analysis
- Use case determination
- Identifying the ownership and sources of data
- DXA functionality

The cost benefit analysis topic is listed, as it may be required to initiate and justify a data integration effort within your organization.

Each of these topics are further addressed below.

Cost Benefit Analysis

Some would argue that developing return-on-investment (ROI) “hard numbers” for a data integration initiative can be a challenge to determine. However, there are several key “value propositions” that can be put forth. Depending on the nature of the integration, these value propositions can none-the-less be translated into compelling estimates in support of a ROI proposal.

Although the cost benefit analysis exercise is shown first in the above list, it is actually very dependent upon doing preliminary work with the other three topics listed.

As illustrated earlier in Figure 2, the first and most important question to be answered is determining the type of integration needed. This in turn will drive answers as to how data will be exchanged and the business processes affected. And finally, based on these conclusions, the nature of the DXA functionality can be established.

Data integration projects in general often consider the value and/or costs associated with:

- User acceptance of existing/proposed solution
- Manual -vs- automated and associated statistical potential for transcription errors
- Duplication of data

- Meeting regulatory requirements
- Process cycles times
- Application and/or data changes due to growth or attrition

These “operational” topics can be further integrated with action steps that can include:

- Cost associated with doing nothing
- Cost of doing something … that is, deploying an integration including make-buy, services, and potentially reworking related business processes
- Cost of DXA, should an specific application integration not be available

No doubt there are countless variations and permutations. A parallel to the ROI exercise, but more anecdotal approach, would be to investigate what others are doing and/or have done. If the axiom is true, that data integration ROIs can be a challenge to compose, it may be worthwhile to look at the experiences of others to develop applicable value propositions for your own organization.

Use Case Determination

As previously discussed, data integration use cases can typically be grouped into four activities. Ultimately, the key answers to be derived address the direction and nature of the data.

However, on a more tactical level, the following specifics must also be determined:

- Access rights
- User interfaces
- “gate keeper” roles
- Alerting
- Error recovery conditions and actions

These can be answered by literally detailing the various interactions a user would encounter as they work with Productstream and the connected application.

Who owns the Data?

Given that PScnt is all about exchanging data, an initial step in the deployment effort will include identifying the nature of the data to be treated. The diagram below illustrates a framework for determining where data currently exists and what is shared by both applications.

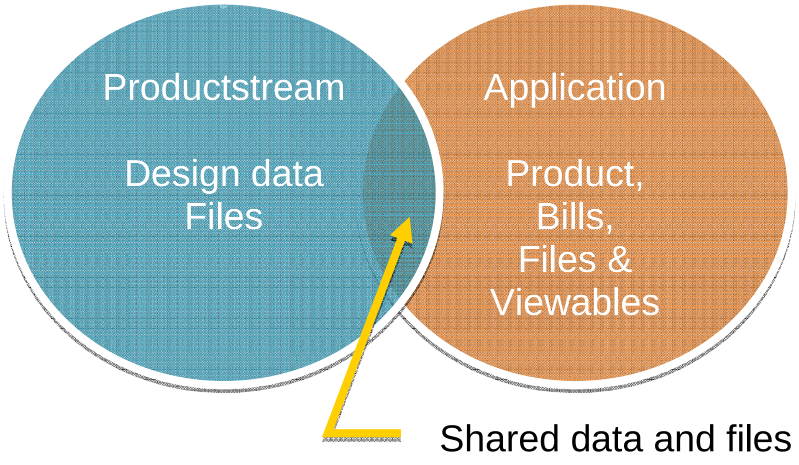


Figure 10
Data Source and Shared Considerations

Within Productstream, the specific objects to consider are items, bills and attachments. Within a connected applications, one of these objects may not even exist and visa versa … there may be objects that do not exist in Productstream.

The nature of the integration will have significant implications for what and how data is exchanged. Figure 11 below illustrates this idea.

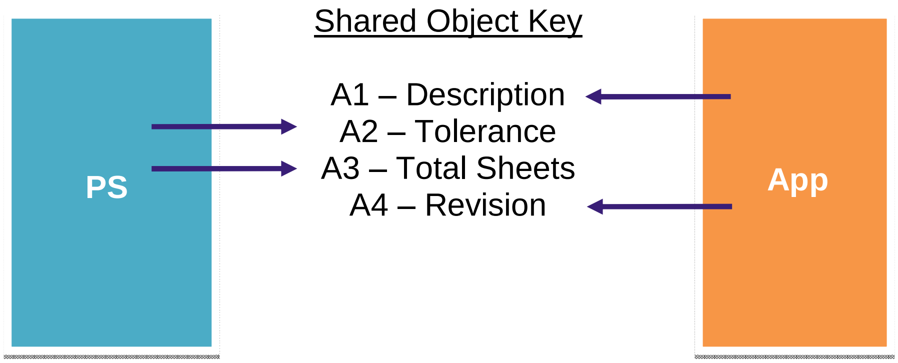


Figure 11
Data Ownership and Mapping

By detailing this "mapping", the needed configuration tables can be established for PScnt. As shown in Figure 9, PScnt leverages an XML tag/value assignment convention. PScnt uses template configuration and mapping tables that can be tailored to the specific needs of the integration.

DXA Functionality

The data exchange adapter (DXA) provides the critical link between the connected application and the PScnt framework. Fundamentally the DXA treats both the incoming and outgoing flow of data and files. PScnt has several pre-developed DXAs for such solutions as ECM, PLM and ERP. However, given the vast range of applications in use today, a DXA may need to be developed.

DXAs are designed to serve as "wrappers" around application programming interfaces (APIs). They normalize standard data and file exchange operations. For outgoing data, the DXA builds an XML file and transmits it to the PScnt engine. For incoming data, the DXA must be able to treat the following object operations:

- creation
- changes
- deletions

The figure below illustrates guidelines for determining the impact for an application specific DXA.

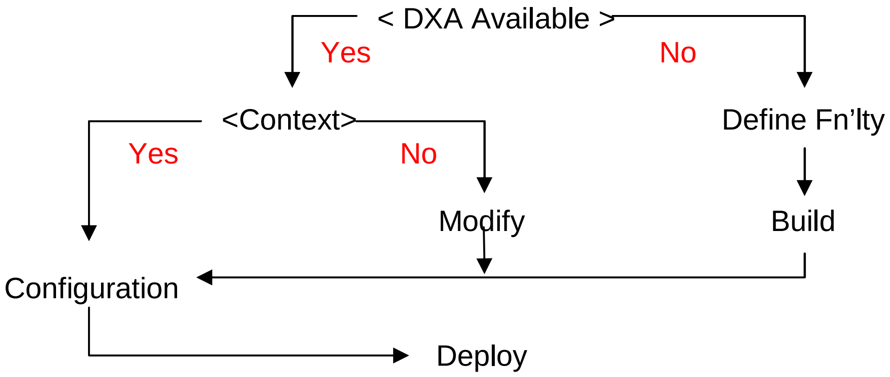


Figure 12
DXA Modification Decision Tree

Conclusion

Integrating Productstream with other enterprise applications offers significant benefits. Ultimately, it contributes to a lower cost of ownership, reduced cost of quality, and faster time to value. Productstream Connect facilitates this gateway to the enterprise and provides a reliable, flexible and scalable platform. Establishing the appropriate "use case" for an integration becomes a vital first step. The exchange of data can be couched in a need to support data migration and initialization, change management, release and/or regulatory compliance. Once determined, information should be in place to develop any type of cost benefits analysis.

Notes

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