

Engineer a product-centric ecosystem

Just-released survey report gives context to efforts to improve management of product information through PLM

SPONSORED BY



BROUGHT TO YOU BY

**Manufacturing
Business Technology**
IT FOR MANUFACTURING EXECUTIVES



SPEAKER:

Chad Jackson
Research Director
Aberdeen Group



Fred Garderes
Director, Supply Chain Mgmt
Crystal Technology



Chuck Cimalore
CTO
Omnify Software



MODERATOR:

Sidney Hill
Executive Editor
Manufacturing Business Technology

SPONSORED BY



BROUGHT TO YOU BY



Top 10 PLM Technology Investment Areas 2008-2010

Technology Solutions Implemented by the Best-in-Class	Currently Using	Planning By 2010	Growth 2008-2010
Digital Rights Management (DRM)	13%	48%	269%
Integration with enterprise applications (ERP, SCM, CRM, etc.)	32%	60%	88%
Recipe / form management	21%	38%	81%
Design	6%		

Source: Aberdeen Group, January 2008

Best-in-Class companies identified the integration of PLM with other enterprise applications as the #2 growth area for technology adoption between 2008-2010

Integrating PLM - Inside and Out

- ❑ Developing, launching, supporting, and profiting from new products requires integration of product data and processes across multiple product development, product data management, design, and analysis applications that make up the PLM or "Product Innovation" Suite
- ❑ Leading companies are integrating PLM with enterprise applications that make up the "Execution Suite" such as ERP, supply chain management (SCM), Manufacturing Execution Systems (MES), and others to better connect product innovation with business planning and execution

Aberdeen's PACE Framework

- ❑ To analyze how effective companies are in improving product profitability through PLM integration, Aberdeen characterizes their approach using:
 - ❑ **P**ressures – What is driving manufacturers to focus on integrating the PLM ecosystem?
 - ❑ **A**ctions – What strategic or tactical initiatives have they put in place to address the challenges of integration?
 - ❑ **C**apabilities – What process, organizational, knowledge management and performance measurement approaches have they adopted?
 - ❑ **E**enablers – What technologies support their integration capabilities?

Aberdeen's Competitive Framework

- ❑ Aberdeen asks respondents how frequently they hit the *metrics that drive product profitability* relating to product innovation.
- ❑ Each respondent is subsequently classified
 - ❑ Best-in-Class – Top 20% performers
 - ❑ Industry Average – Middle 50% performers
 - ❑ Laggards – Bottom 30% performers
- ❑ Best-in-Class companies are analyzed to determine which integration approaches (PACE), if any, help them achieve their superior performance

Report Demographics

Aberdeen Group examined the experience and intentions of the PLM integration strategies and plans of over 270 enterprises, both within the Innovation Suite and across the enterprise ecosystem. Aberdeen surveyed what is driving these companies to integrate, what systems specifically they are integrating, what steps they are taking, and what benefits they are seeing as a result.

- Respondents included a range of manufacturers across a variety of industries. Those sectors seeing the highest number of respondents are:
 - Industrial Equipment Manufacturing: 14%
 - Consumer Goods: 14%
 - Automotive: 11%
 - 9% each of Aerospace/Defense and High Technology
 - 7% Medical Devices
- When categorized by revenue:
 - 20% Small (Under \$50 million)
 - 38% Mid-size (Between \$50 million and \$1 billion)
 - 42% Large (Over \$1 Billion)
- When categorized by employee headcount:
 - 16% Small (Under 100 employees)
 - 30% Mid-size (Between 100 and 999 employees)
 - 54% Large (Over 1,000 employees)
- The majority of respondents (65%) indicated they are located in North America, the remaining respondents
 - Europe 20%
 - Asia / South Pacific: 11%
 - Other: 4%

Pressures Driving Integration: Within the PLM Suite

Pressures	All Respondents
Streamline product development processes	47%
Support distributed, global design teams	27%
Integrate product and manufacturing process design	23%
Reduce cost of wasted time and effort	18%
Coordinate change process across systems / people	19%

Source: [AberdeenGroup](#), April 2008

The primary driver for companies to integrate their product innovation or PLM suites is the need for speed and efficiency

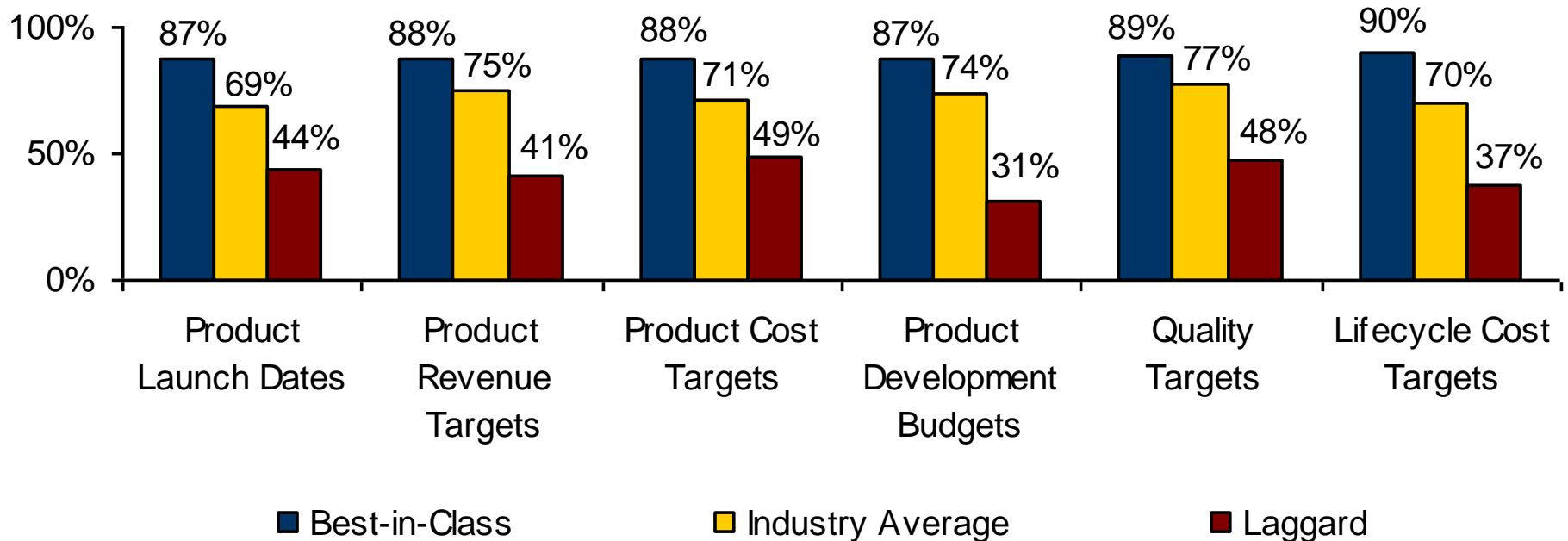
Pressures Driving Integration: Across the Enterprise Ecosystem

Pressures	All Respondents
Release products more effectively to manufacturing	40%
Coordinate change process across systems / people	36%
Release products more effectively to supply chain	22%
Streamline product development processes	32%
Eliminate errors	14%

Source: AberdeenGroup, April 2008

Drivers include releasing products more effectively to manufacturing and coordinating change, two main friction points between Engineering and Manufacturing

The Maturity Class Framework

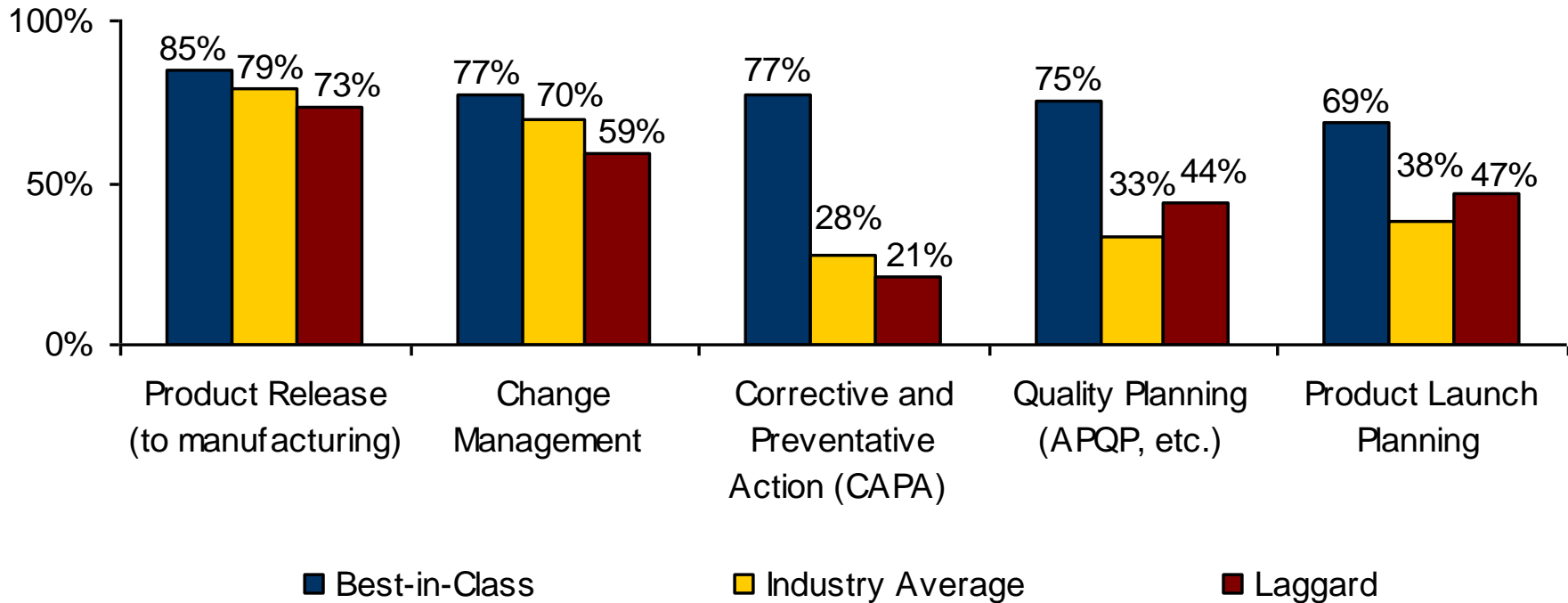


Source: AberdeenGroup, April 2008

What do the Best-in-Class companies do differently in regards to PLM integration?

Integrating the PLM Ecosystem

Strategic Actions: Integrating PLM Processes



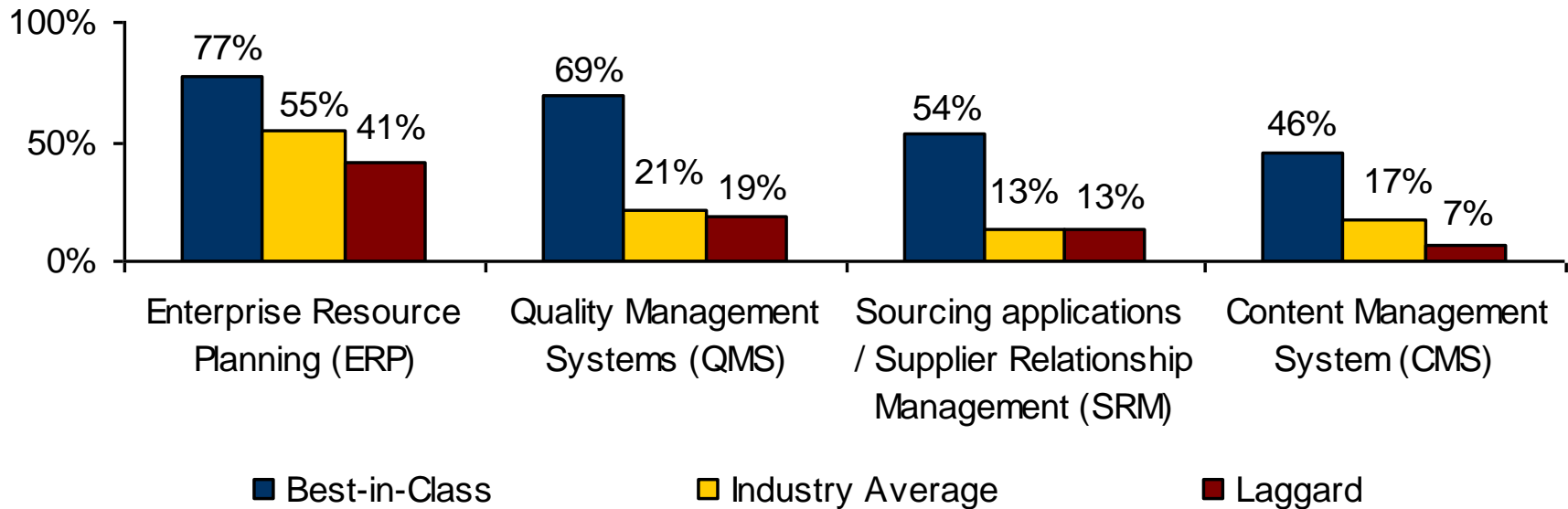
Source: AberdeenGroup, April 2008

Improving release to manufacturing and change management are the leaders overall, but Best-in-Class place additional focus on integrating quality processes.

Integrating the PLM Ecosystem

Strategic Actions:

Integrating Applications across the Enterprise Ecosystem



Source: AberdeenGroup, April 2008

Best-in-Class companies are much more likely to integrate. ERP is relatively common, but the Best-in-Class go farther to include quality, sourcing, and content management

Data Integrated between PLM and ERP

	Best-in-Class	Industry Average	Laggard
ERP TO PLM	Costs / Actual Costs		
	78%	67%	86%
	Sourcing Data		
	67%	42%	71%
	Vendor / Supplier Data		
	67%	33%	14%
PLM to ERP	Bills of Material (BOMs)		
	90%	93%	33%
	Change Orders		
	60%	60%	50%
	Should be Costs		
	60%	13%	67%

Source: [AberdeenGroup](#), April 2008

Most companies have some integration from PLM to ERP,
Best-in-Class are sharing bi-directionally

Key Takeaways

- ❑ PLM integration is being pursued at all levels, indicating strong need for integrated solutions
- ❑ Integration helps to drive improved performance in the metrics that drive product profitability, Best-in-Class take a broader approach to integration
- ❑ There is no “silver bullet” for integration, even the Best-in-Class are compelled to use multiple approaches
- ❑ Highest growth areas planned by the Best-in-Class include SOA, PIM, MDM, and LDAP.
- ❑ Data synchronization within the PLM suite is proving value in addition to centralization
- ❑ PLM is emerging as the system of record for a broad range of product-related data



Contact

Aberdeen *Group*

A Harte-Hanks Company

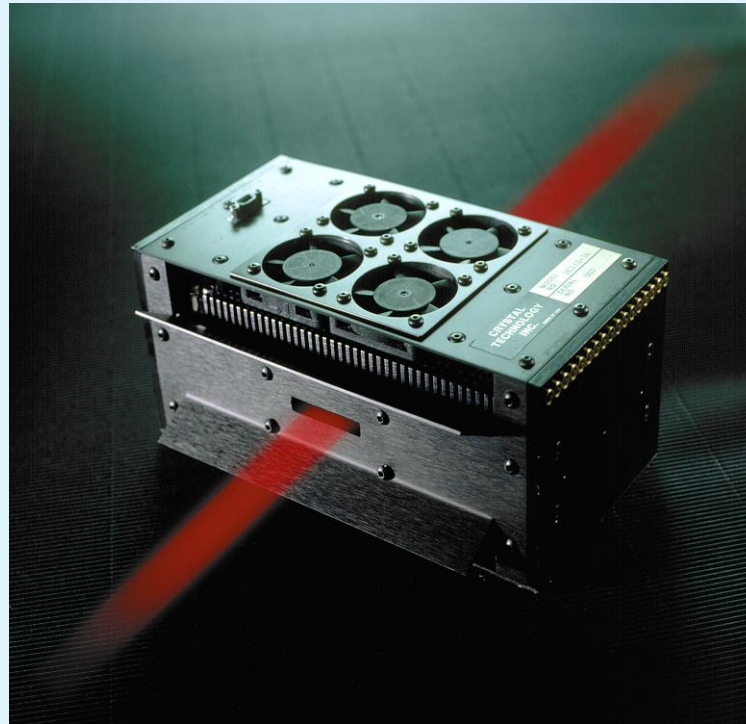


Turn to Aberdeen
for Research with Results™



Crystal Technology, Inc.

An EPCOS Company



Creating an Integrated PLM Ecosystem with Omnify Software

Agenda

- Brief company and products description
- Business constraints
- Implementation
- Current status
- Next Steps

Who are we?



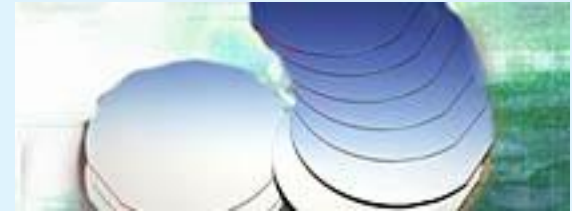
Crystal Technology is the world's leading producer of lithium niobate crystals and high performance acousto-optic components.

Main Products & Markets

Lithium Niobate wafers:

75 / 100 / 125mm diameter X 0.35 – 1.25mm thick.
Polished one or two surfaces.

Key Applications: Surface Acoustic Wave (SAW) filters.
Electronic filters based on piezoelectric properties of Lithium Niobate.



Acousto-Optic Components:

Acousto-optic Deflectors Modulators, Parallel (Multi-Channel) Modulators, Tunable Filters and associated drive electronics.

Key Applications: Inspection and imaging applications in Semiconductor, assembly and flat panel production, direct write photo-finishing, ophthalmic inspection, and broad variety of OEM laser modulation



Key Business/Design Constraints

Market drives shorter product design cycles: eliminate waste!

- Data should be easy to access, anywhere (reduce data mining)
- Data should be consistent across all systems (reduce confusion)
- Data must flow freely through reviews & organization (streamline)

Diverse product lines involving different teams

- Multiple review loops

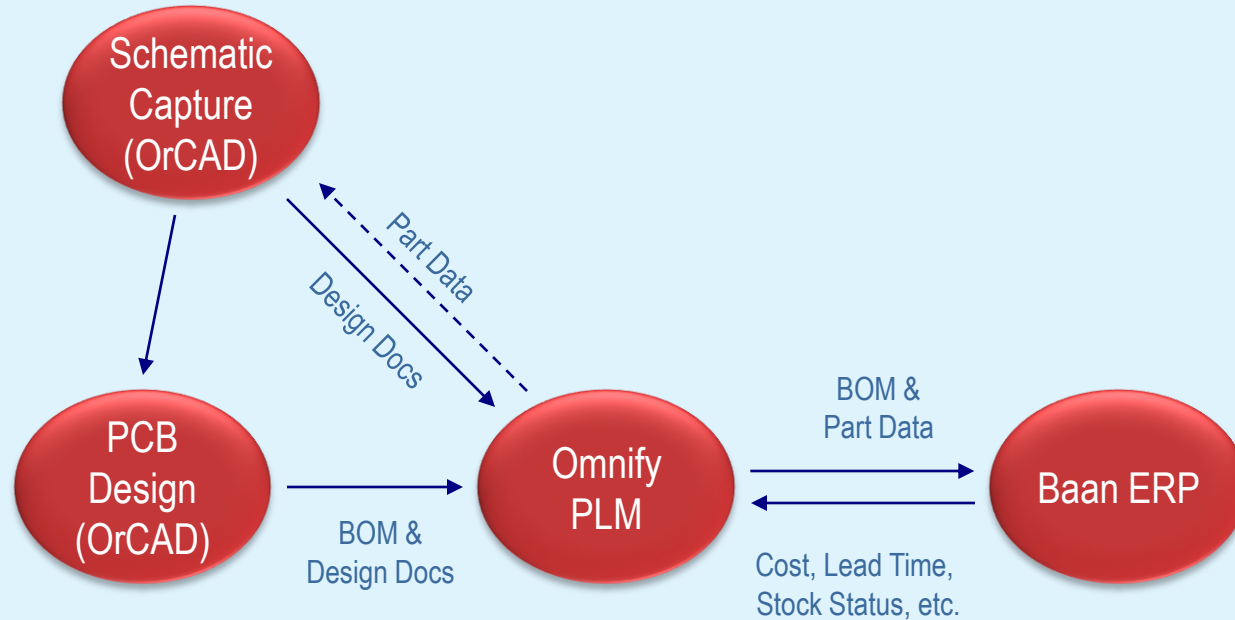
Heavy product customization leads to ever expanding parts bin

- Parts filtering, and selection to avoid redundancies

Electronics designs are outsourced

- Ease of packaging all key data for external users

Solution: Integrated Design Environment



Streamline product development and change management processes

----- Future development

Omnify Software: Integration with our systems

- ✓ Omnify is the birth place of all parts and products: this is our sandbox!
- ✓ Omnify is more flexible than **BaaN IV**

**OMNIFY WILL BE THE MASTER FOR ALL PARTS AND PRODUCTS
FROM CRADLE TO GRAVE**

- ✓ BaaN IV needs parts/products info to drive total supply chain

All parts and BOMs are pushed from Omnify to BaaN IV

- ✓ Key data should be available to our design teams for DFM and DSCM

Key ERP data should be available in Omnify

Interface between Omnify and BaaN IV

~140 fields (attributes) passed, multiple tables mirrored

Typical Parts attributes list

Desktop - [Item: 27-00016-01 (Read Only)]

File Edit View Tools Window Help

Items: <Keyword Search>

Object Viewer

Database Navigator

- Home Page
- My Task List
- Part Requests (0)
- Changes/ECOs (7)
- Database Searches
 - Database Search
 - Vendors Search
 - Item Searches
 - All Items
 - All BOMs
 - Item Types
 - Chemicals Component
 - Chemicals Growth
 - Chemicals Wafer Fab
 - Direct Material Componer
 - 27 Electronic Connec
 - 08 Packing, Shipping
 - 35 Mechanical Parts,
 - 43 Transistors
 - 25 PC Boards, Inter
 - 29 IC, Diodes, Volt
 - 84 AO Transducers
 - 30 Inductors, Ferrite
 - 42 Transformers
 - 40 Miscellaneous Elec
 - 07 Tubing
 - 97 Finished Goods
 - 23 Fans, Fuses, LEDs
 - 24 Amplifiers, Power
 - 37 Resistors, Fixed a
 - 05 Adhesives, Tapes,
 - 06 Fasteners, Hardw
 - 31 Electrical Cables, t
 - 45 Switches
 - 28 Capacitors
 - 41 Wire
 - 36 Identification part

27-00016-01 - (Attributes/Parameters) Rev: *

General

Attributes

Documents

Vendors

Parts List

Comments

Changes/ECOs

Where Used

Service Objects

History

Signoff

Attributes/Parameters

Add

Groups: <All>

Cost Price Type	2-Inventory Valuation
Country of Origin	000-UNITED STATES OF AMERICA
Critical in MPS?	2-No
Cumulative Issue	0
Cumulative Purchase Receipts	0
Currency	USD-US Dollars
Default Container for MRP/MPS	
Description	
Direct Delivery from Quantity	9999999.99
Economic Order Quantity	19
Expected Annual Issue	0
First Allowed Order Date	
Fixed Order Quantity	0
Floor Stock?	1-Yes
Forecast Method	
Frequency for Storage Inspection	0
Hard Allocated Inventory	0
Inspection Reqd?	2-No
Interim Results	2-No
Inventory (at MRP run)	0
Inventory Blocked for MPS/MRP	0
Inventory Carrying Costs	0
Inventory on Hand	2180
Inventory on Hold	0
Inventory on Order	0
Inventory UOM	ea-each
Inventory Valuation	1-FTP (Standard Cost Price)
* Item Group	DIRMAT-Expensed Direct Material
Item Text	0
Item Type (Project)	1-Item
* Item Type	1-Purchased
Last Cost Price Transaction Date	11/22/2006
Last Counting Date	02/11/2007
Last Inventory Transaction Date	02/11/2007
Last Purchase Price Transaction Date	
Last Sales Price Transaction Date	

Business Processes implemented

Omnify is the MASTER for parts/products from cradle to grave

- Parts/BOM creation (use ORCAD BOM Imports)
- Document Vaulting
- Parts and BOMs lifecycle events (ECOs)
- Supply-chain parameters maintenance

All engineering activities still compliant to Quality Management requirements

- Implement workflows for approvals

Typical Workflow set-up

The screenshot displays the 'Administrator - Workflows' application. The left sidebar contains a tree view of 'Option Pages' including Home Page, Database Options, Auto Numbers, Formats, Types, Categories/Status, Attributes, Change/ECO Options, Vendor Data, Projects, Corrective/Preventive Action, Training, Task Options, Document Vaults, Default/Required Fields, Rules, Advanced, User Options, User Information, Permissions, User Groups, Business Units, Workflow Options, Signoff Stages, Workflows, Workflow Mappings, Alerts, Email Alerts, and Script Actions.

The main window shows the 'Workflows' section for the workflow 'Sub-Assembly Crystal Fab Change'. It includes buttons for 'Add...', 'Edit...', and 'Remove'. Below this, the workflow stages are listed: 'Initial', 'Document Control', 'Sub-Assembly Crystal Fab Change', 'Cost Accounting', and 'Document Control'. Each stage has 'Remove Stage', 'Move Up', and 'Move Down' options. The 'Sub-Assembly Crystal Fab Change' stage is highlighted in blue. To the right of each stage is a 'Reject To:' box, which is set to 'Initial' for all stages. A 'Remove Reject Stage' link is provided for each 'Reject To:' box.

Workflow: Sub-Assembly Crystal Fab Change

Workflow (Sub-Assembly Crystal Fab Change) stages/flow:

- Initial
 - Remove Stage
 - Move Up
 - Set "Reject To"
 - Move Down
- Document Control
 - Remove Stage
 - Move Up
 - Set "Reject To"
 - Move Down

Reject To: Initial

Remove Reject Stage
- Sub-Assembly Crystal Fab Change
 - Remove Stage
 - Move Up
 - Set "Reject To"
 - Move Down

Reject To: Initial

Remove Reject Stage
- Cost Accounting
 - Remove Stage
 - Move Up
 - Set "Reject To"
 - Move Down

Reject To: Initial

Remove Reject Stage
- Document Control
 - Remove Stage
 - Move Up
 - Set "Reject To"
 - Move Down

Reject To: Initial

Remove Reject Stage

Data Structure / Tags

Use of Item Types & Categories to:

- Enable fast queries
- Drive life-cycle events

Workflow Conditions

Workflow map: **Chemicals Wafer Fab Add**

Workflow type: **Item**

Item type: **Chemicals Wafer Fab**

Category:

Attribute name:

Attribute value:

Project:

Business unit:

OK Cancel



Current Status

Very satisfied with the results

- ✓ Ease of configuration
- ✓ Little customization needed to reach key needs
- ✓ Simple, yet efficient interface
- ✓ Much faster to retrieve historical and current information
- ✓ Small gain to date on ECO cycle (from ~12 to ~10 days)

Challenges

- ✓ User adoption: engineers are “forced” into working with the process
- ✓ CTI Implementation doesn’t capture the stage “idea-to-document”
 - ✓ Engineering Change Request not available yet
- ✓ ~140 attributes passed: opportunities for errors, lengthy validation

Next steps

Engineering Change Requests

- ✓ Document the change process at the earliest steps!
- ✓ Involve **all users at the earliest steps!**

Develop full-on interface for Approved Vendor List

- ✓ Avoid dual maintenance of Supplier Master Data file

Implement Omnify Empower with Quality & Project Module

- ✓ One repository place for document control and quality management
- ✓ Eliminate multiple homegrown databases
- ✓ Integrated NPI cycle!

Integrating PLM into the Business Environment

Chuck Cimalore
Chief Technology Officer
Omnify Software

Observations

- 6 Although integration requirements contain common elements (item/part data, BOMs, ECOs, documents, etc.), each “integration/interface” will encompass unique characteristics given customer environment and operating standards
- 6 Many customers rely on vendors and integrators to develop specifications
 - Customers need to be aware of “integration” options and technology and work with vendors to develop requirements
- 6 Many Vendors ignore engineering system integration
 - MCAD (2D/3D), ECAD, PCB, PDM
- 6 Some Vendors and Integrators create a mystique around “Integrations”
 - Reality is that most integrations are not complex or very challenging
 - Most vendors provide modules and/or technology to push and pull data through their systems

Common Areas of Integration

6 PLM and ERP

- PLM to ERP
 - New Items (Released) and Revisions, AML
 - New BOMs/Revisions
 - Changes/ECOs (updated item and BOM information), Effective Dates
- ERP to PLM
 - Costs, Inventory, Status/Availability
 - AVL (Approved Vendor List)

6 PLM and Engineering

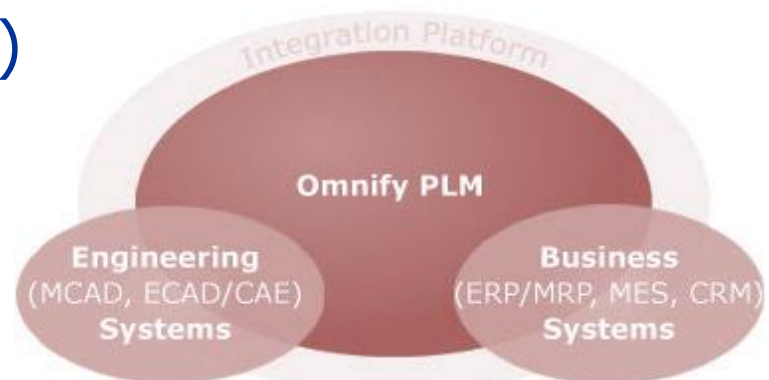
- PLM to Engineering
 - Part Information/Attributes (Parameters, Costs, Status)
 - Documents (Specifications, Datasheets, Design Notes, etc.)
 - Revision Checking
- Engineering to PLM
 - Released BOMs and documents (Drawings, Schematics, PCB, etc.)

6 PLM and CRM

- PLM to CRM
 - Product numbers (Part Numbers/IDs), Configuration information (Attributes, BOMs)
- CRM to PLM
 - Customer Names, RMAs

The Omnify Approach

- Built from the ground up on a Service Oriented Architecture
 - Leverages a variety of Open Standards
 - Web Services: XML, SOAP
 - Direct Database: ODBC/ODBC.NET, ADO/ADO.NET
 - Application Integration: COM/OLE, Scripting, File passing, etc.
- Trigger-based operations: ensures real-time data passing
- Out-of-the-box integrations with various Engineering tools (CADKit™)



Recommendations

- 6 Use “Phased” approach (if possible)
 - Start with the basics
 - PLM system implementation and “integrations” are often launched simultaneously
 - Phased approach allows you to gain a better understanding PLM and all of it’s capabilities
 - Allows you to investigate other areas of improvement
- 6 Understand all integration capabilities by talking to vendors and other customers about available technology and common operations
- 6 Understand and manage all required resources
 - Many “integrations” require IT resources for setup and testing
- 6 Don’t let integration requirements (and inevitable debates) delay PLM implementation
 - PLM has proven to provide immediate benefits with or without “integrations”

QUESTIONS?

On the bottom left hand side of your screen, type your question in the white box and hit **SUBMIT** button

SPONSORED BY



BROUGHT TO YOU BY



Thank you for listening

You may download a copy of the presentation by clicking on “**DOWNLOAD SLIDES**” on your interface.

Finally, don't forget to take our brief survey, which will launch on your browser in a few moments.

(To participate in the survey, please **turn off your pop-blocker.**)

SPONSORED BY



BROUGHT TO YOU BY

