Sustaining Leadership in Product Lifecycle Support

Ralph Ainsworth
19th November 2003
Warwick
About PTC … A History of Innovation

18 years of Leadership in Product Development

33,000 customer worldwide

Highly active in all key Verticals A&D, Automotive, High Tech, IT and Consumer Products

Major investment in new products

- More than $1 Billion invested in PLM to date
- Create – Pro/ENGINEER Wildfire
- Collaborate – Windchill ProjectLink
- Control – Windchill PDMLink

PTC delivers the only comprehensive system for Product Development and Product Lifecycle Management

- Product First Focus
- Collaborative Capabilities

PTC is the world’s largest software company with a total commitment to Product Development
Our Leadership position is becoming increasingly recognized: An Analyst’s View

“…[PTC’s] PLM offering, comprised of an extensive set of Link application products built on the Windchill platform, is the widest true suite available in the market.” AMR Research

“...If things go well, PTC could be the market leader over the critical next three years.”

AMR Research
PTC – A Global Customer Base

- Embraer: Web-based project collaboration and visualization
- Evans & Sutherland: Product data and change management with workflow
- Exostar: Secure, hosted project collaboration service
- FiatAvio: Data and document mgmt. with product visualization
- Flight Refuelling: Drawing library system with enterprise-wide access
- General Atomics: Web-based Integrated Data Environment (IDE) for design criteria, specs., models, analyses, processes, contracts
- General Dynamics: Web-based Integrated Data Environment (IDE) to manage all Stryker / IAV program data
- Bath Iron Works: Electronic Drawing Release (EDR) allows work package automation
- GKN plc: Product development system including design, collaboration, data mgmt.
- Goodrich: Web-based engineering data management and Mechanical design
- Gulfstream: Mechanical analysis
- Hamilton Sundstrand: Behavioral design and analysis
- Harris: Design and analysis, and enterprise data management and collaboration
- Honeywell: Design tolerance analysis, and modeling
- ITT Industries: Design and analysis, single source of globally accessible data, as well as knowledge and workflow management
PTC - A Global Customer Base

Design and data mgmt., analysis and visualization for aircraft interiors

Kawasaki Heavy Industries – mechanical design

Design and analysis with workgroup data management

Enterprise PDM with product visualization

Design and analysis with data management

EPDM - automated data management capabilities with lifecycles & workflows

IMF – integrated management framework for program visibility

Deepwater – Integrated digital environment

Behavioral modeling and analysis

Global Hawk - concurrent engineering and virtual mockups

Deepwater - Integrated digital environment

Design and analysis with data management
### PTC – A Global Customers Base

<table>
<thead>
<tr>
<th>Customer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerojet</td>
<td>Design and modeling including interfaces to other design, analysis, and manufacturing software.</td>
</tr>
<tr>
<td>Airbus</td>
<td>Product information backbone connecting design and mfg. staff in 3 countries at 15 sites - includes product structure, change mgmt. and overall release process.</td>
</tr>
<tr>
<td>Ball</td>
<td>Ball Aerospace - Behavioral modeling and analysis.</td>
</tr>
<tr>
<td>Alcatel</td>
<td>Submarine Networks Div. – Design and data mgmt. driving high reuse.</td>
</tr>
<tr>
<td>Learjet</td>
<td>Learjet – Behavioral analysis and modeling.</td>
</tr>
<tr>
<td>Alenia Spazio</td>
<td>Lifecycle management of information and project management, workflow, document and change management.</td>
</tr>
<tr>
<td>Boeing</td>
<td>Advanced Collaboration Environment (ACE) for Army FCS program; eCollaboration solution; mech. and thermal design and analysis.</td>
</tr>
<tr>
<td>BAE Systems</td>
<td>Integrated bill-of-information and workflow with links to reqmt’s., planning, CAD.</td>
</tr>
<tr>
<td>AlliedSignal</td>
<td>[Honeywell] Concurrent design and drawing development for structural analysis and casting procurement.</td>
</tr>
<tr>
<td>CargoLifter</td>
<td>Static and dynamic modeling of aircraft flight simulators.</td>
</tr>
<tr>
<td>ATK</td>
<td>Manage collaborative design and development of the Objective Individual Combat Weapon with mfg. partners and the customer.</td>
</tr>
<tr>
<td>CAE</td>
<td>Web-based, single sign-on ePDM system with ties to ECAD, MCAD, ERP and sourcing systems.</td>
</tr>
<tr>
<td>DRS Technologies</td>
<td>Web-based PDM system for configuration management, workflow &amp; lifecycle processes &amp; visualization of design data.</td>
</tr>
<tr>
<td>EDO Corporation</td>
<td>Project collaboration with customers and suppliers.</td>
</tr>
</tbody>
</table>
Government Customers

BCT - manage design data and interrogate, refine and optimize design alternatives

ACMS – Replaced JEDMICS and TDCMS with Windchill Foundation

DD(X)
Naval Reactor Group – Design, dynamic analysis, surface modeling, and data management

Developing Requirements and Proof of Concept for Joint Synthetic Battlespace

LANL - collaborative engineering environment for communications, configuration management
LLNL - model based design, mfg. and project planning methods

Deepwater – Lockheed Martin and Northrop Grumman – individual Integrated Digital Environments

JSC - initiate and track hardware manufacturing requests
MSFC – Collaborative Engineering
SLI - evaluate concepts in terms of cost, performance and safety
Advanced Engineering Environment – Modeling and Simulation
FCS - Advanced Collaboration Environment (ACE)

What Matters Most?
Products and Services
The Digital Product Value Chain Determines Initiative Success

Digital Product Value Chain
Where the most impactful product decisions are made, features and cost determined, suppliers and materials locked-in.

SUPPLIERS

ENGINEERING

MANUFACTURING

PROCUREMENT

MARKETING

SALES

SERVICE

CUSTOMERS

ERP

CRM

Physical Product

Digital Product

Release to Manufacturing

Solution Specification

Requirements Capture
Way Forward

**PLCS Compliance and Early Implementation**

**Windchill PDMLink** is compliant with PDM Schema today

Early pilots with the extended PLCS schema give confidence that compliance with AP239 can be achieved

Now moving into a testing and pilot implementation phase as DEX’s definitions become available

Our early focus is on exchange of product structures and associated parts/documents, configuration management/change control and data exchange with other applications

Incorporation of AP239 capabilities into core product will be driven by customer demand
PTC technologies provide the collaborative capabilities needed to successfully manage Product Data through the whole lifecycle

**Collaborative Development**
- Collaborative Environments made real
- Deliver DABA capabilities
- Acceleration - Reduced Cycle Times

**Manufacturing Collaboration**
- Improved design & manufacturing processes
- Improved delivery & installation support
- Improved product change management

**Supplier Collaboration**
- Improved spare part availability
- Improved part repair capability
- Extend existing supplier collaboration agreements

**After-Market Support Solution**
- Re-use of digital product information
- Configuration management at all levels down to specific product instance
- Compliance with emerging STEP standards (ISO10303, AP239 PLCS)

**Customer Collaboration**
- Contractor support service capability
- Improved product life-cycle management
- Improved service contract coordination
- Increased visibility into after-market support activities and product use

*The use of Digital Product Definition for after-market support creates new business opportunities*
PLCS – Our people are bringing it into the mainstream
PLCS – Making it happen

The PLCS Demonstrator

Preliminary Design → Full Concept Definition → Product Realisation

Preliminary Design → Production → In Service Support → Disposal

EUROPROP International

© 2003 PTC
Products and Services

Create, Collaborate and Control – 3Cs

Create high fidelity digital products

Pro/ENGINEER® Wildfire is the leading mechanical computer-aided design (MCAD) software, offering the broadest set of capabilities covering the entire product development spectrum-from art-to-part.

Collaborate cross-functionally in an organization and throughout the digital product value chain

Windchill ProjectLink, the complete project collaboration solution for product development.

Control and manage product information and product development processes throughout the product’s lifecycle from concept to disposal

Windchill PDMLink, the single source of product information for the enterprise.

Value to our Customers

- End-to-end product development processes optimization
- Quickly and accurately create a single, complete, and unambiguous digital product model
- Reduce prototypes, enhance product performance and maximize data re-use
- Enterprise collaboration and supply chain integration throughout the product lifecycle
- Effective information management across the extended enterprise
- Through life configuration management and change control of product information