NIST Open ICT Systems (March 13-14, 2006)

OPENNESS IN PRODUCT LIFECYCLE MANAGEMENT

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Standards Types

- **Open Standards – interoperability & integration**
  - Open standards are not software applications; they are only specifications.
  - Specifications must be published, generally available (“open”) & must be detailed enough for any company to develop a toolkit to support the format.
  - Developed by consensus of group or consortium
  - Example: STEP (ISO, PDES), XML (W3C), UML (OMG)

- **Industry Standards – technologies commonly used**
  - SDK (API) Specification must be Published for other Independent Software Vendors (ISV) to use (i.e Read or Write Format). Licensing of the SDK may be required.
  - One Company may wield a tremendous amount of control over the “standard”.
  - Example: The Java™ technology

- **De Facto Standards – wide adoption**
  - Must be adopted by key industry firms (users) & key independent software vendors (ISV).
  - Example: The Simple Object Access Protocol (SOAP) was initially a de facto standard, because of its broad use in Web services, tho’ now formalized as open standard in W3C.

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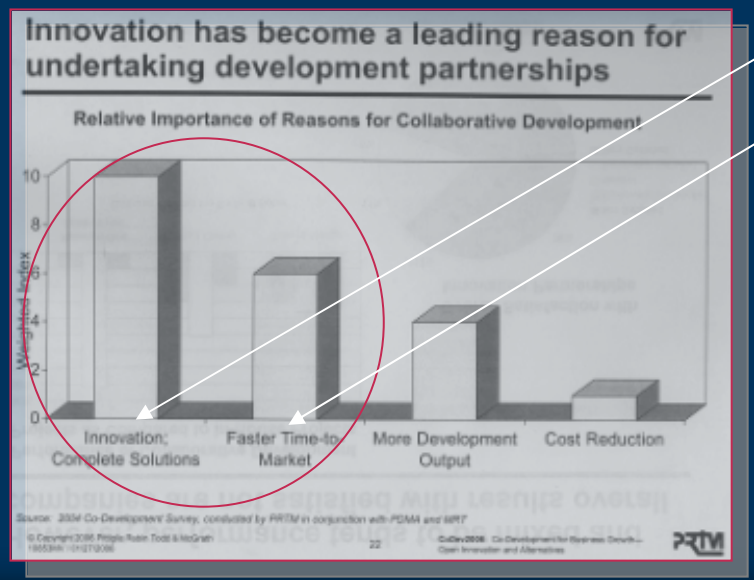
Do Open strategies support innovation goals? …The broader market's view

Spent 23 weeks in business best seller lists

New way to bring innovations to market

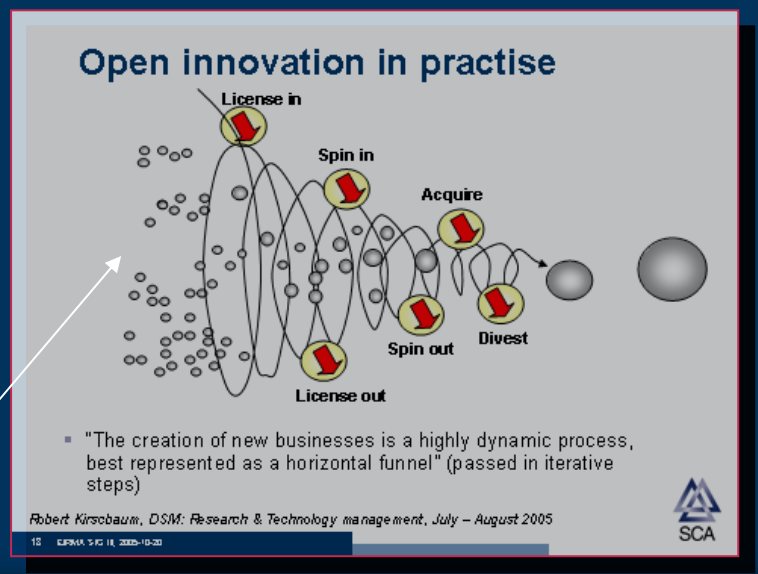
$9.3B spent on "Collaborative R&D"



Innovation

Faster TTM

The "swiss-cheese" development funnel



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“Open” - Difference in approach … Mid-Market vs. Enterprise

Midmarket

- Openness has more downsides (cost)
- Key issues:
  - Integration through standard technologies
  - Interoperability of workgroup platforms through well established specifications (STEP, IGES…)

Enterprise

- Openness is considered a requirement
- Key issues:
  - Enterprise / modular architecture
  - Success in integrating to major business systems (e.g. ERP, CRM, SCM…)

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Analyst Reports – Open Systems & Integration

"Bottom line: CAx and PLM can both benefit from componentization of software solutions – CAx because it is mature, and customers want highly targeted solutions; PLM because it is immature, and customers value overall system integration and performance."

"UGS takes a lead in terms of both breadth of background and experience. The history and positioning gives UGS the advantage of being the most practiced company with open systems, heterogeneous data, and process integration across multiple industrial sectors."

"There is little question that extensive use of JT-enabled applications can improve the efficiency of a business enterprise, especially for organizations involved in the design and manufacturing of complex products on a global basis."

"Many organizations consider using product information visualization solutions as a point solution applied to only one or a few processes within product development, however, this minimizes value because it does not take advantage of the potential of leveraging high-value data in other areas."

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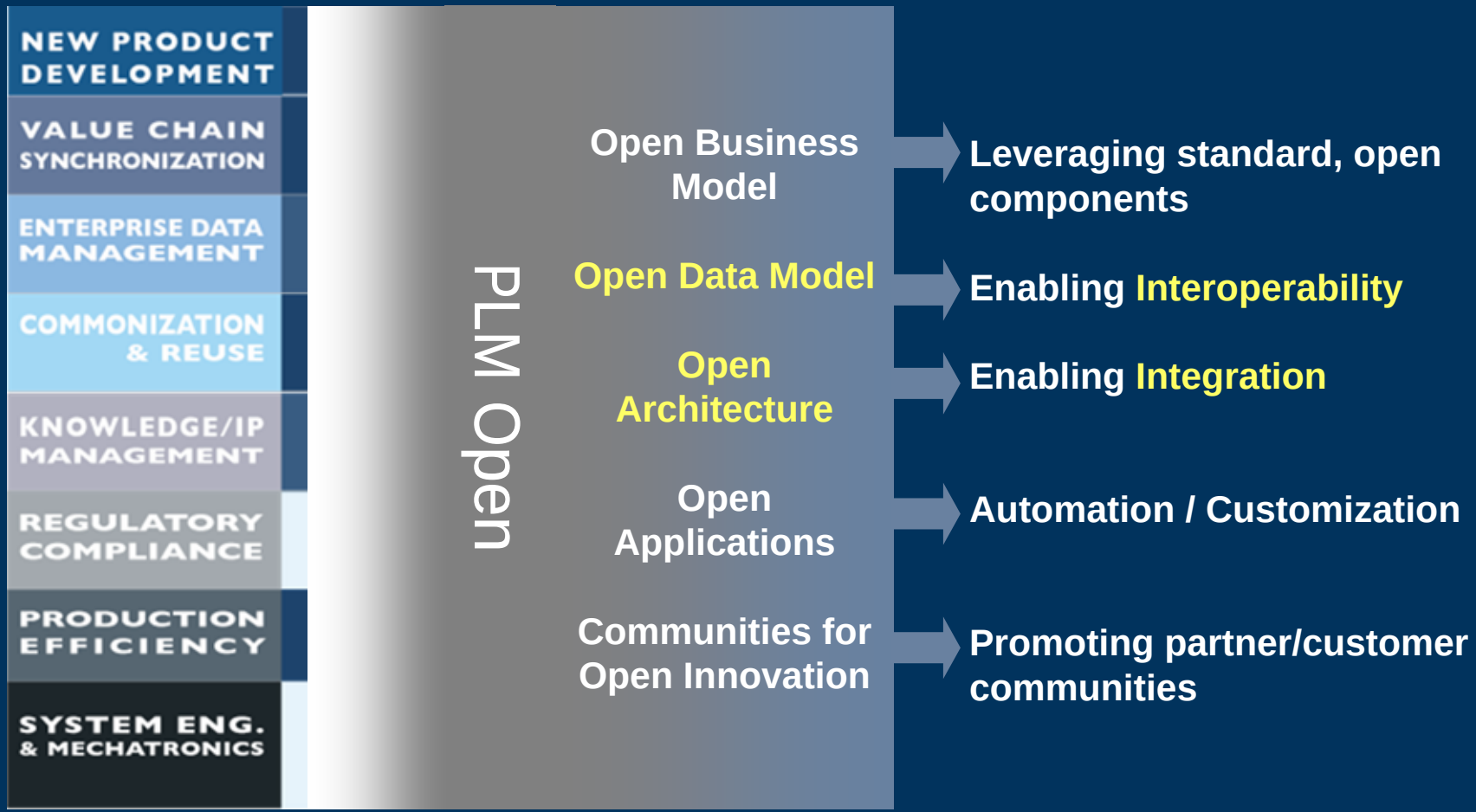
Open-ness As A Strategy (at UGS)



PLM Open Powers the Global Innovation Network

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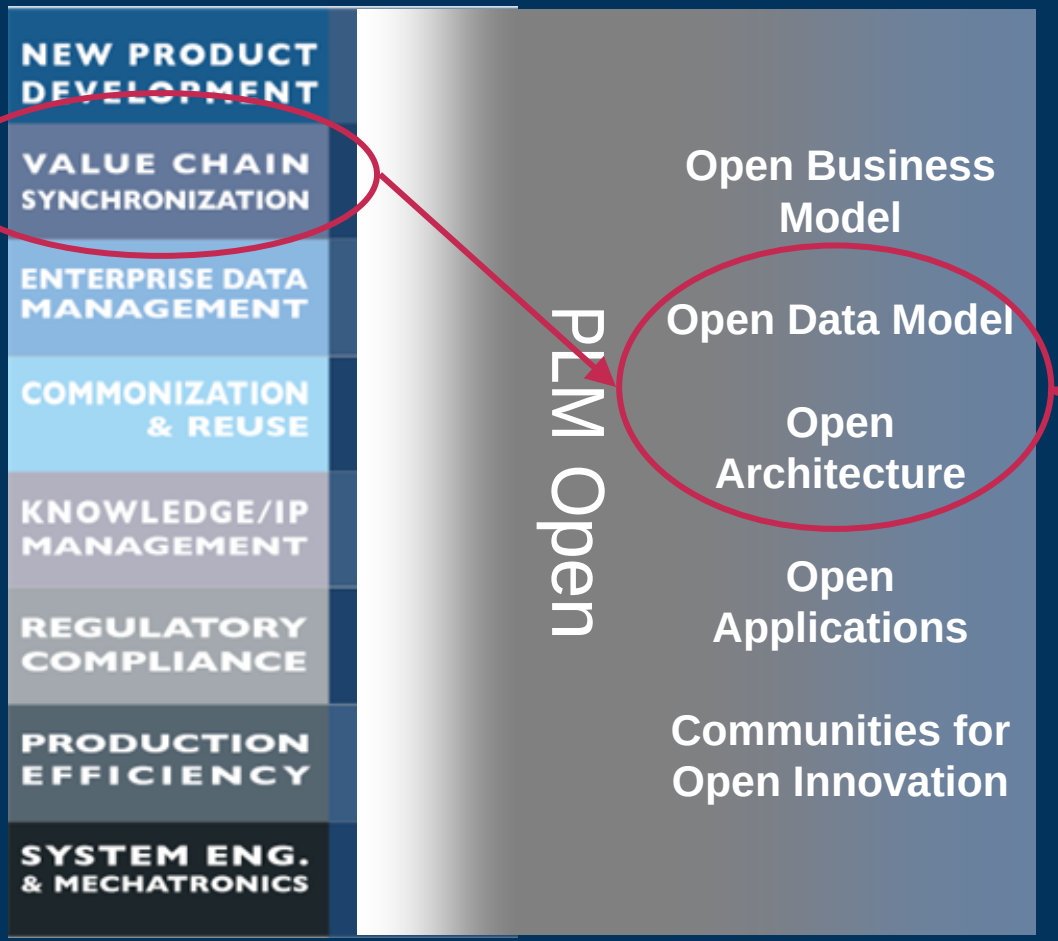
Industry Benefit – Value Chain Synchronization



Our **Open Architecture** and our **Open Data Model** (**JT** and **PLM XML**) connect diverse partners in a flexible way that provides maximum IP protection that is required to **Synchronize the Value Chain**

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What is JT? (jtopen.com)

- JT is the representation for lightweight data in UGS' interoperability data pipeline (for Product Lifecycle Management)
- JT is a rich data model
  - Facet information
  - Lighting models
  - Texture maps
  - Precise geometry ("brep")
  - Attributes (Metadata)
    - Color, layer & font
  - Product Manufacturing Information (PMI)
  - Wire harness information

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JT Open – Growth to De Facto Standard

Market Demands…	UGS Delivers…
▸ Free viewer	▸ JT2GO multi-format viewer
▸ Boards to drive actions & progress at UGS	▸ Technical Review Board (TRB) ▸ E.g. Plano, TX week of February 20, 2006 attended by Boeing, Ford, .et.al. ▸ Management Review Board (MRB)

▸ Open & published
  ▸ Cost avoidance & long-term internal data retention
  ▸ Collaboration & flexibility among community of suppliers
  ▸ Level playing field
	▸ UGS publishes binary definition in 2006
	▸ JT Open Program: Independent Software Vendors (ISV) included – e.g. Adobe, Alias, Autodesk, PTC, Right Hemisphere, etc.

Adoption: More than 4,000,000 JT-enabled PLM licenses
PLM & 3D data reach over 500,000,000 desktops with free Adobe Reader (PDF)

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Summary – PLM XML (plmxlm.org)

PLM XML is:

- A technology promulgated by UGS as the unifying XML representation of the PLM data model
- Conformed to XSD schema, W3
- Progressively being exposed to the market by UGS
- Used extensively inside UGS applications as the interoperability mechanism for PLM data

PLM XML benefits:

- Free & openly available
- Level playing field tool kits to support usage
- COTS applications embody & produce it (e.g. Teamcenter)
- Simplifies mapping to:
  - Other data models
  - Standards-of-choice
- Enables services industry to map to external business systems

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Challenges

- Market adoption & thus standardization is often the most important factor in deciding the fate of a technology
- More difficult to make money on the software side of open-source marketing
- Interpretation that “Open”-ness is something that everyone needs but no one can make money on.

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