

CMI User Day

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Collaborative Engineering



See the possibilities™

Topics to be Discussed

- Vehicle Development Process
- Recent Technological Advances
- Collaborative Design Process
- Product Information Management
- Metaphase/CATIA Interface

Traditional Vehicle Development Process

- Vehicle Manufacturer (VM) Centric
- Development work done at VM's physical site
- Design requirements & specifications dictated by the VMs
- Physical prototyping and testing
- Manual processes for product data exchange
- Most integration work done by VMs

New Virtual Vehicle Development Process

- Shared design responsibilities between VMs & Suppliers
- Physical collocation, primarily for packaging work
- Jointly developed design requirements & specifications
- Systems approach with a Tier-I lead.
- Tier-I suppliers assuming systems responsibility by:
 - Providing integration of components
 - Providing integration of Tier2...n suppliers
- Global design teams with regional expertise
- Replacing Physical prototyping and testing with Digital Mockups & CAE
- Electronic processes for product data exchange

Virtual Processes Made Possible Through

- Creation of Collaborative Environments to enable joint product development
- Electronic Collocation for simultaneous access to design data
- Use of Visualization Technology
- PDM (PIM) tools & methods for managing complex product assemblies
- Robust digital data exchange capabilities
- Expanded global network infrastructure
- Worldwide availability of Web-based tools
- Improvements in Digital Mockups & CAE technologies

Recent Technology Advances

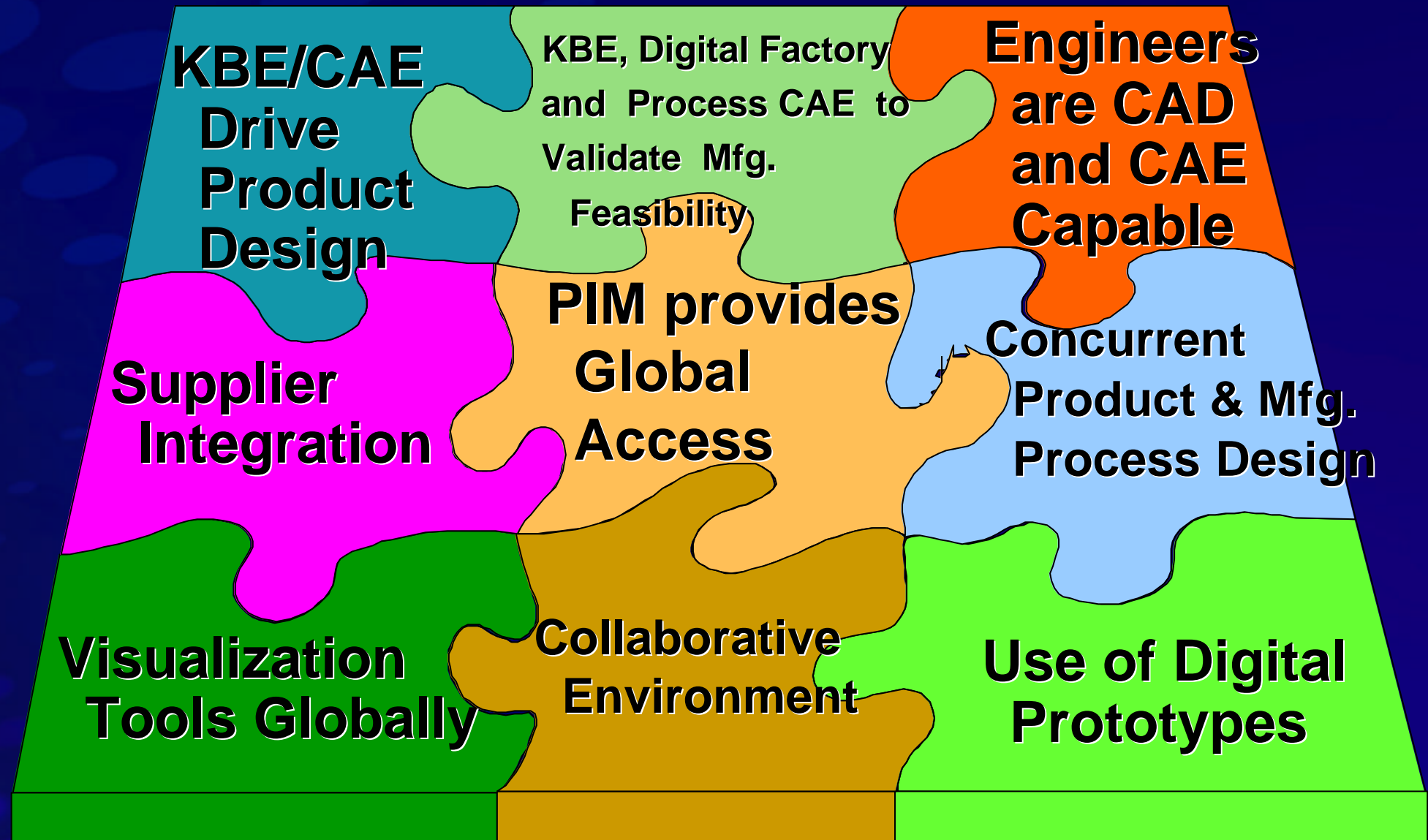
From:

- Paper Drawings →
- Individual Parts →
- Different Authoring Tools →
- Uncontrolled Storage →
- Prototypes/testing →
- Design Manual →
- Physical Collocation →
- Manual CDX →

To:

- Digital Representation
- Complex Assemblies
- Common Visual Format
- Catalog for reuse
- Digital Simulation
- Interactive KB Design
- Virtual Collocation
- Electronic CDX

Integrated Product & Manufacturing Design Processes



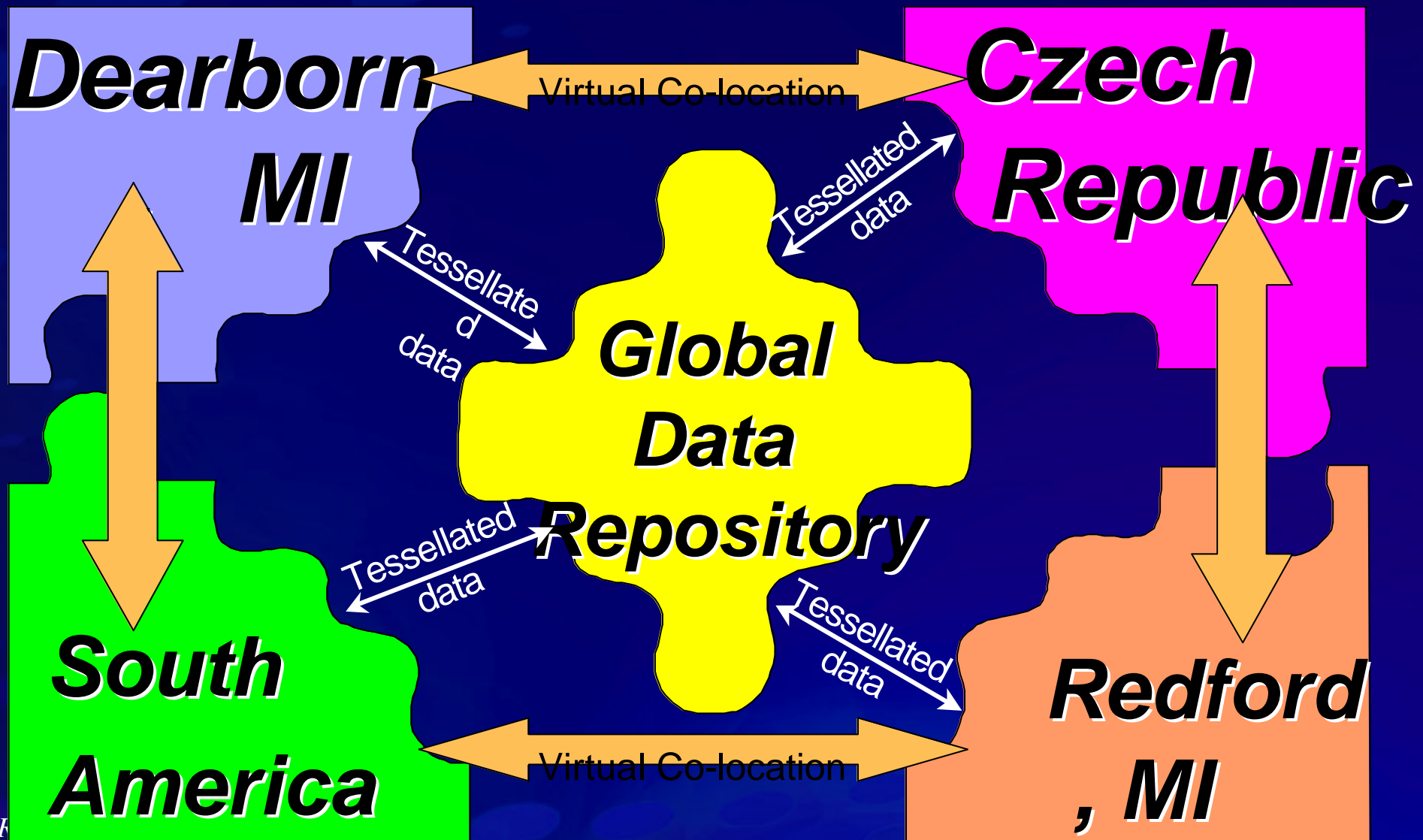
E-Collaboration

- Need to establish a joint product development environment among business partners.
 - The demand for Native full-history CAD data from VMs should be based on needs, and not nice-to-have
- Exploring people, process & technology issues to enable high-performing, globally distributed teams
- Need to leverage global centers of excellence
- Use of Netmeeting as well as Visualization technologies

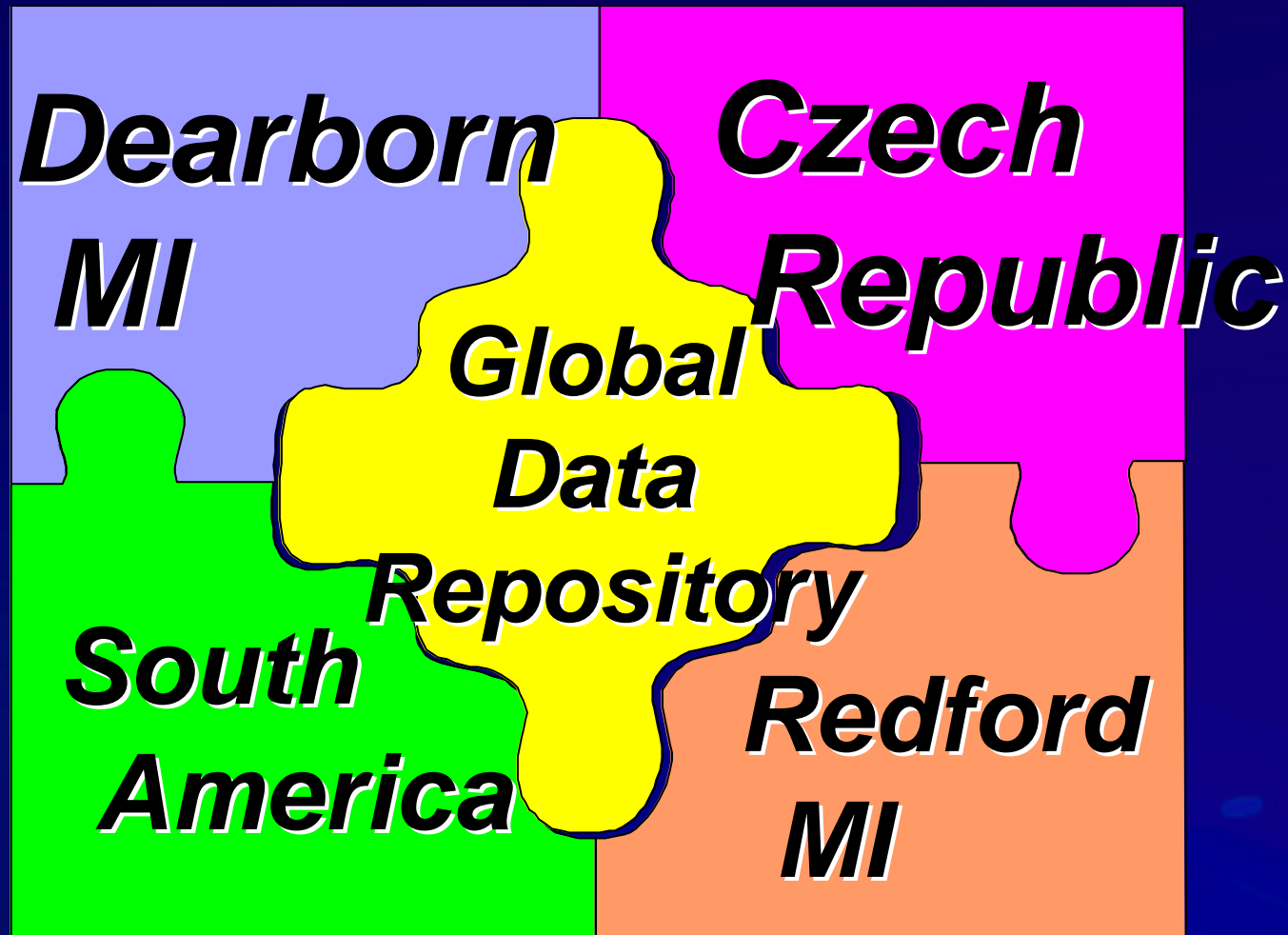
World-wide data sharing today (Lamp Design Example)



World-wide data sharing with Visualization Tools



World-wide data sharing with Visualization and Virtual Collocation Tools



PIM Enables: Enterprise Data Sharing

- ❑ *Real Time Global Access*
- ❑ *Multi CAD Data Management*
- ❑ *Digital Buck*
- ❑ *Product Re-use*
- ❑ *Visteon & Customer Security*

E - Collaboration

E - Release

E - Data Exchange

E - Visualization

Product Development

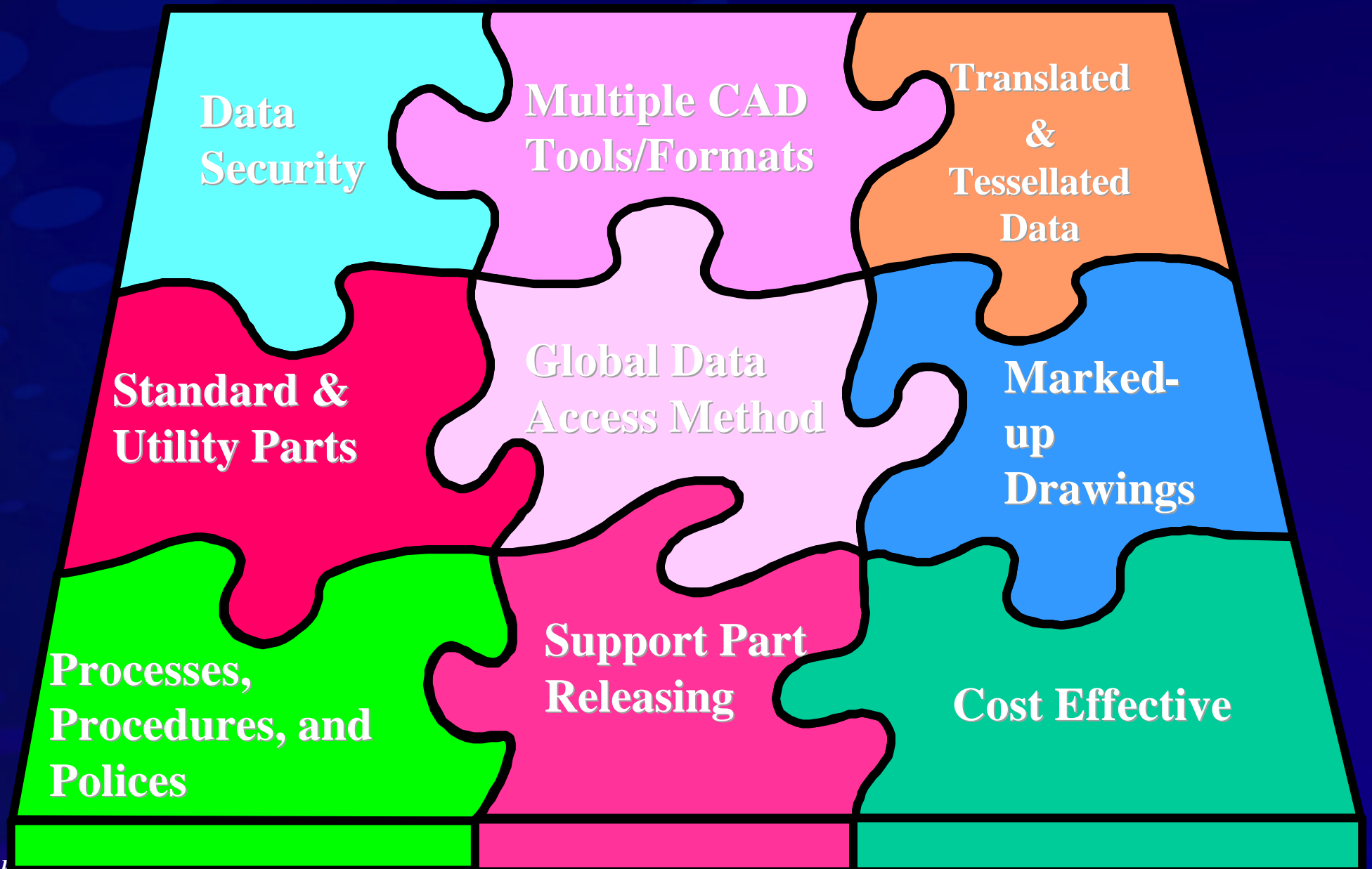
Purchasing

Finance

Marketing

Manufacturing

PIM: the glue that keeps the puzzle together



e-Engineering



Communicat

DFM/DFA



Produ
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CAD

Factory



CAE

lization



Simultane
Engineering

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Processes



Engineering Portal

e-Engineering

Supplier Challenges

- VMs demand data in their format
- VMs are now requiring Suppliers to work in the VM's PDM/PIM system as well
- Suppliers need to support VMs, globally distributed technical centers, manufacturing plants, tool shops, and lower Tier suppliers!
- Mutual win-win between customers & suppliers can be achieved by focusing on what's needed versus nice to have
- Need for data exchange has grown by orders of magnitude (100x) due to fully defined solid models
- Suppliers need to manage multi-CAD data with real-time access for modification, reference and translations, as needed

Product Info Management

- Use of Metaphase as the core PDM engine
- Using CMI for Catia & UMI for UniGraphics
- Use of TDM & IMI (I-DEAS Metaphase Interface) for Ford business
- Also using iMAN for GM specific business and UG data
- Release in Metaphase for global sharing within Visteon

CMI at Visteon

- Part of Multi CAD Data Management Initiative to manage UG, Catia, and CADDs data
- Global Implementation – used in US, Europe, and South America at this time
- Implementation supports Catia version 4.2.X

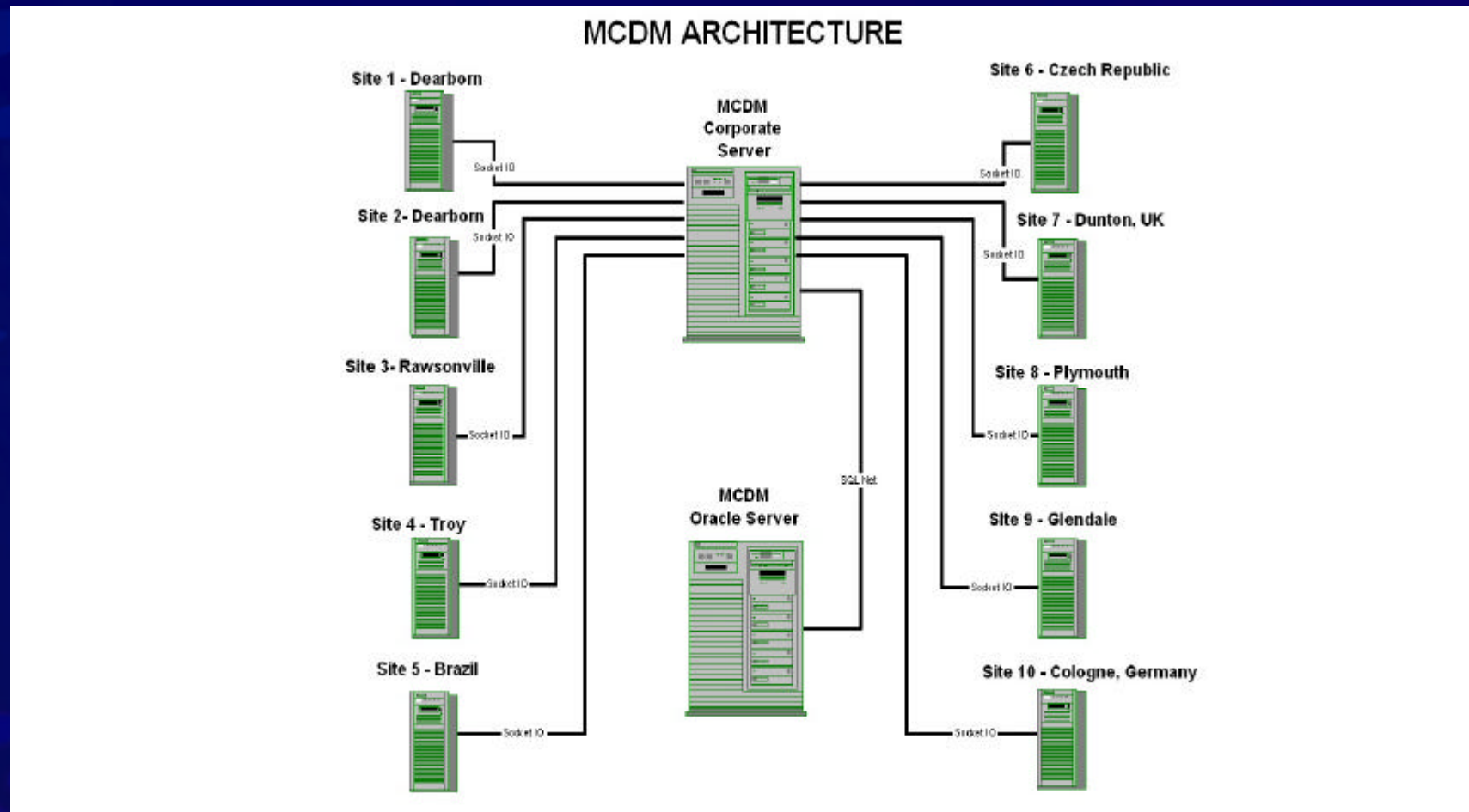
Benefits to the Organization

- Secured Data Vault
- Access Control for CAD data, especially in multi-customer environment
- Access to Metadata without the need of CAD tool
- Revision Control
- CAD data release process
- Data Sharing across Visteon globally, including remote plant locations
- Multi CAD data in a single depository

Architecture

Single Metaphase instance with Distributed vault locations.

10 Sites – 52 Users



CMI Specific Benefits

- Enables Concurrent Engineering for Catia Users
- Creation and Use of Product Structure
- Users able to access vaulted data in Metaphase, directly through Catia
- Ease of data sharing among users – local and remote

User Concerns

- User has to deal with multiple Metaphase windows in addition to Catia
- For a simple task like read a file from the vault takes 8 clicks (and data entry) and is more cumbersome than the normal Catia
- Merge Feature does not work the way it works in Catia
- Assembly Feature allows you to delete and replace parts but not add new parts.
- Session files created in cmi with Catia models do not get updated when models in the vault are updated.
- Session files cannot be modified to add/delete models.

Potential Improvements

- Better Integration with Metaphase in terms of user interface
 - User should not see "omf" windows.
 - Check in , check out for modification, check out for reference should be initiated within Catia.

Required

METAPHSE
READ
UPDATE
CHECKIN
CHECKOUT
CREATE
ASSEMBLY
PREFERENCE
REGISTER
DELETE
SESSION
FREEZE
PLOT
DEFAULT
HELP

Present

METAPHSE
READ
UPDATE
REREAD
DOCUMENT
ASSEMBLY
PLOT
DEFAULT
HELP

Potential Improvements

- Merge function should work the same as in Catia
- It should be possible to import an assembly into a single model, to be shipped to non-CMI based users
- Enhanced Session files management
- Allow addition of parts to an assembly from within CMI
- Support for multiple versions of Catia, including V5, in the same instance.

Q & A?