

# Ford Motor Company



## Collaborating for Superior Products

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Global Product Creation Systems, Director  
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Ford Motor Company



# Collaborating around a Common Purpose

## Question:

What do you call it when a group of people get together just to share?

## Answer:

**Gossip !**



**Successful collaboration begins with having a clear and attainable goal for the collaboration.**

- For Ford, successful collaboration cannot end at producing technically superior products efficiently.
- Successful collaboration must be gauged by its influence on marketplace performance.
- Ford is attempting to align loose, ad-hoc, and isolated collaborative efforts to a common enterprise vision for collaboration

## Ford Collaboration

Collaboration at Ford means building a synergistic relationship between ***external*** and ***internal*** concerns in order to produce better and *more successful* products

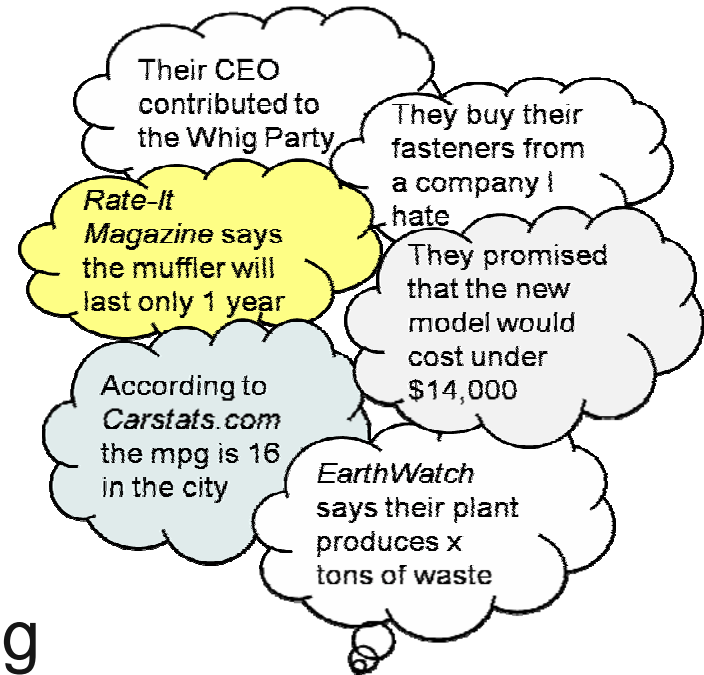


Meeting this mandate requires ***great teamwork***



# Why Collaborate Externally? Consumer/ Market Demand

Production – Sales  
= **Scrap**



In today's environment of free-flowing information, meeting consumers' expectations and demands involves much more than just a good product.

Making consumers and business partners an active part of product creation has become essential to marketplace success.



# Why Collaborate Internally? **Productivity & Efficiency**

- **To uncover partitioned & hidden *Enterprise Knowledge* by:**
  - Dismantling “information silos” to enable effective decision making
- **To unleash the Potential of Experts by:**
  - Promoting and increasing the cross-functional participation of our experts
- **To build and preserve Collective Intelligence by:**
  - Capturing & leveraging key experiences from our sizable and diverse community
- **To promote Creativity & Innovation by:**
  - Harnessing the “wisdom of the crowd” to enable Ford’s collective intelligence to be applied toward creative efforts



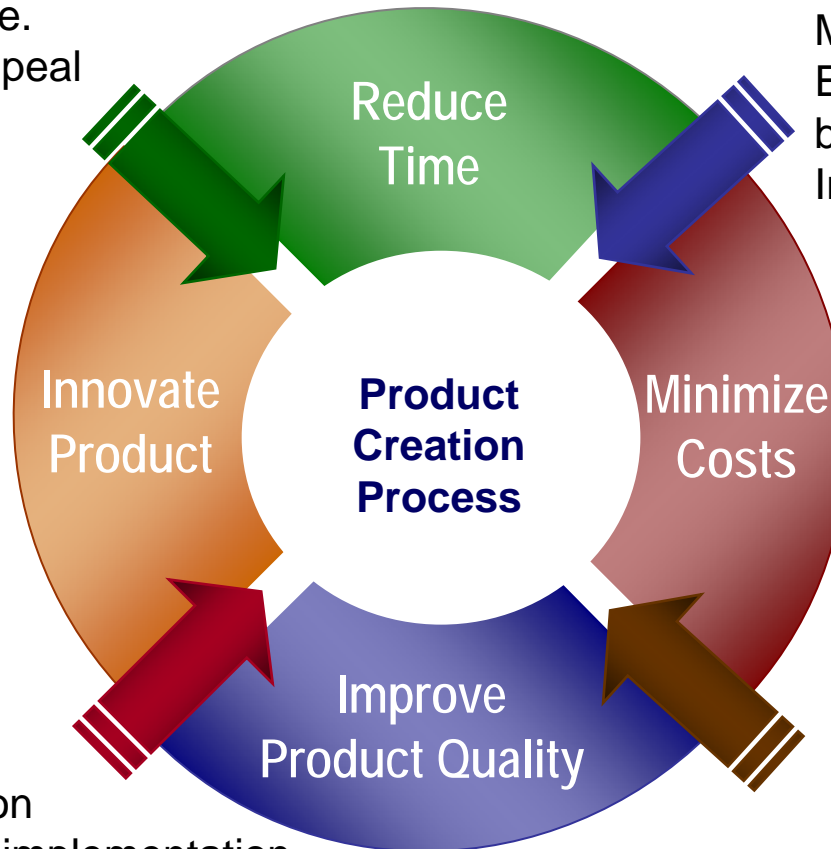
# Business Drivers for Collaboration

## **Globalization**

Design, build, maintain anywhere at anytime.  
Special segment appeal and cultural fit.

## **Product Variety/Complexity**

Increased product features.  
Maximize product reuse.  
Extensive customization, build-to-order, ease of use.  
Increase product effectiveness.



## **Competition**

Product differentiation  
Swift Innovation and implementation.  
Consolidation & focus on core competencies.


## **Cost & Price Pressure**

Lower cost of failure.  
Control cost of making.  
Demand for global pricing.  
Provide quality at lower price.  
Decreased product margins.




# Collaboration: A Knowledge Environment Demand

Information =  
**Potential Power**



So ...

An environment of free-flowing  
information means ...



... an environment of free-flowing  
**power creation potential.**

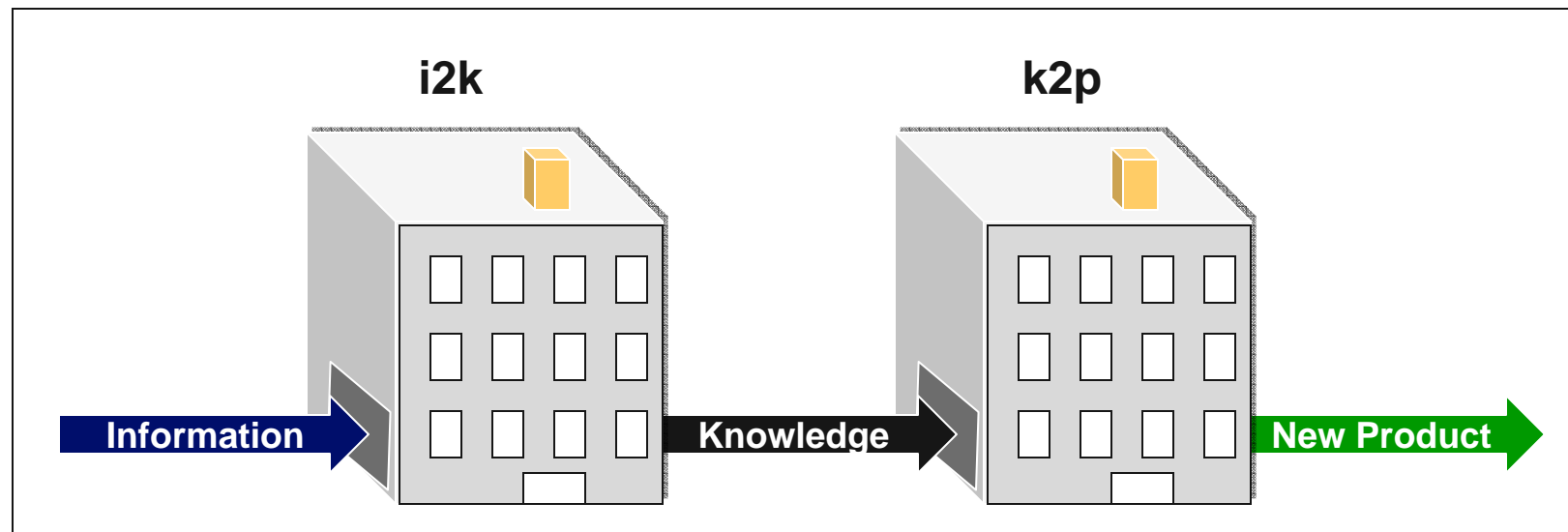
In today's knowledge environment the advantage is with those who can make the most from what is quickly becoming:  
**a *shared global information pool*.**

- Business collaboration, in all of its forms, serves to enable Ford to better compete by getting more bang from available resources.
- There must be *“collaboration amongst collaboration efforts”* around a common vision, and the common goal of competitive success.

## Collaboration Challenge: Knowledge Creation & Use

Competitive pressures demand continuous improvement in two critical production areas:

1. Information-to-Knowledge (*i2k*) conversion
2. Knowledge-to-Product (*k2p*) creation

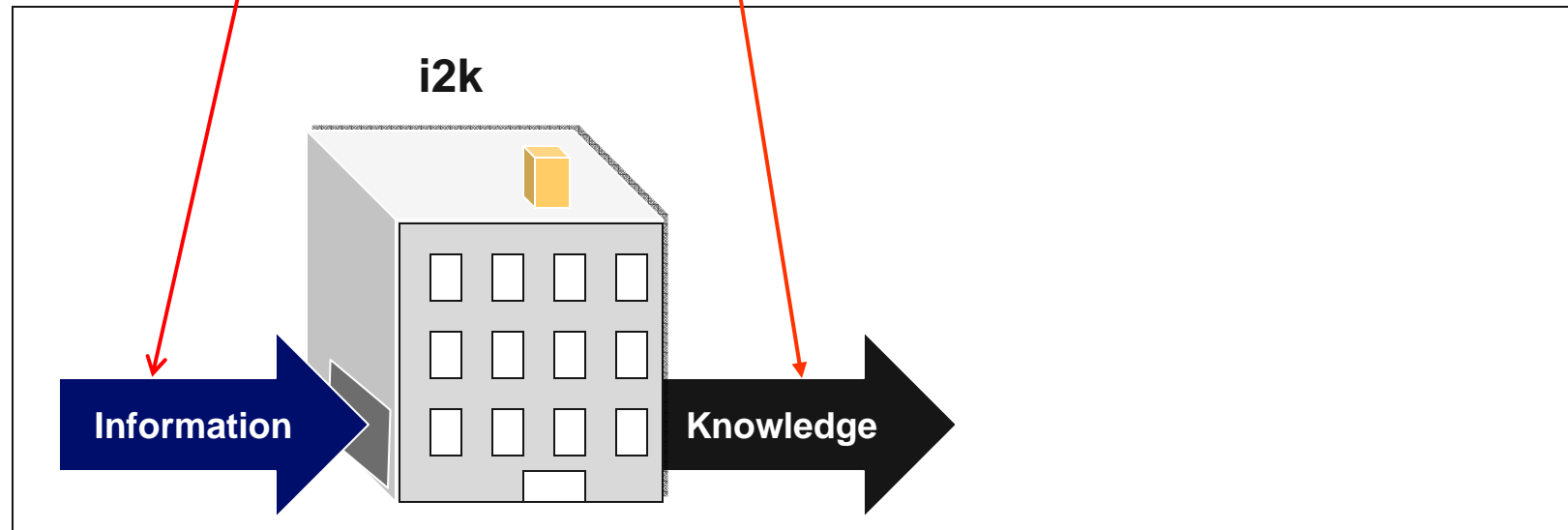




## Collaboration Challenge: **Inclusive Creation**

**Information used to create company knowledge should represent the concerns & perspective of:**

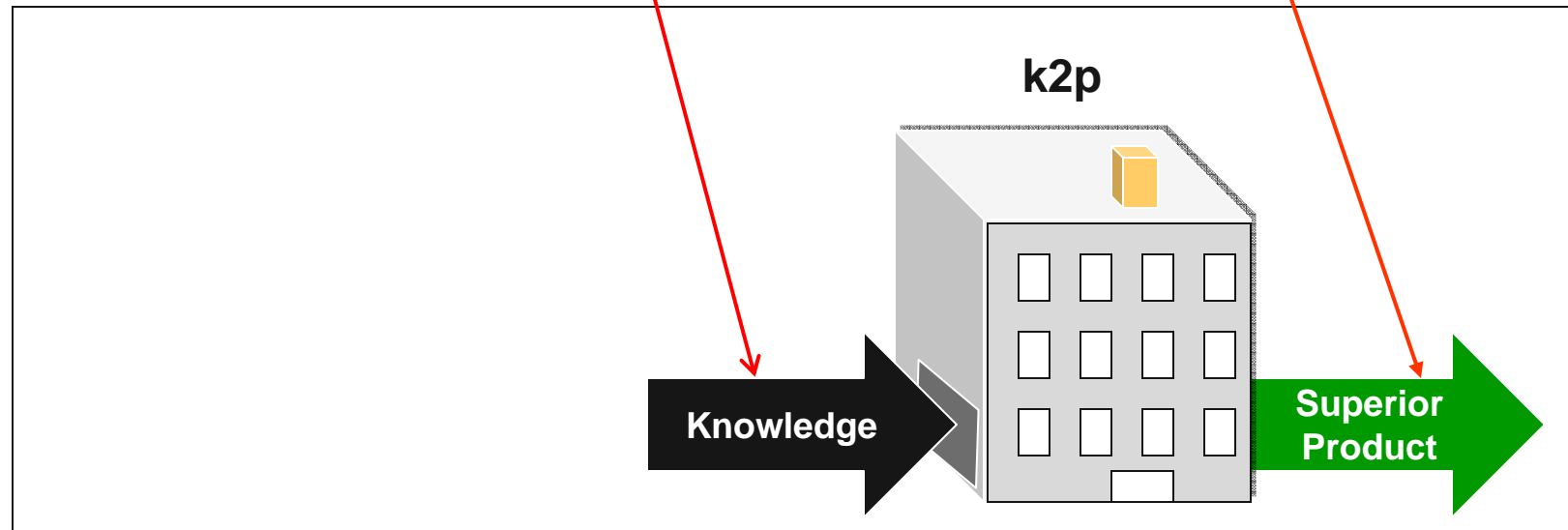
- **Customers,**
- **Suppliers and Partners,**
- **Employees,**
- **and the Marketplace in general**



## Collaboration Challenge: **Effective Usage**

**Knowledge created should better support :**

- **Needs & Expectations of Consumers**
- **Decision-Making**
- **Product Development**
- **Overall Operations**



# Enabling Collaborative Success at Ford

**Collaboration strategies and tools serve to meet either or both of the following roles:**

## **1.Fostering Community Creation & Development**

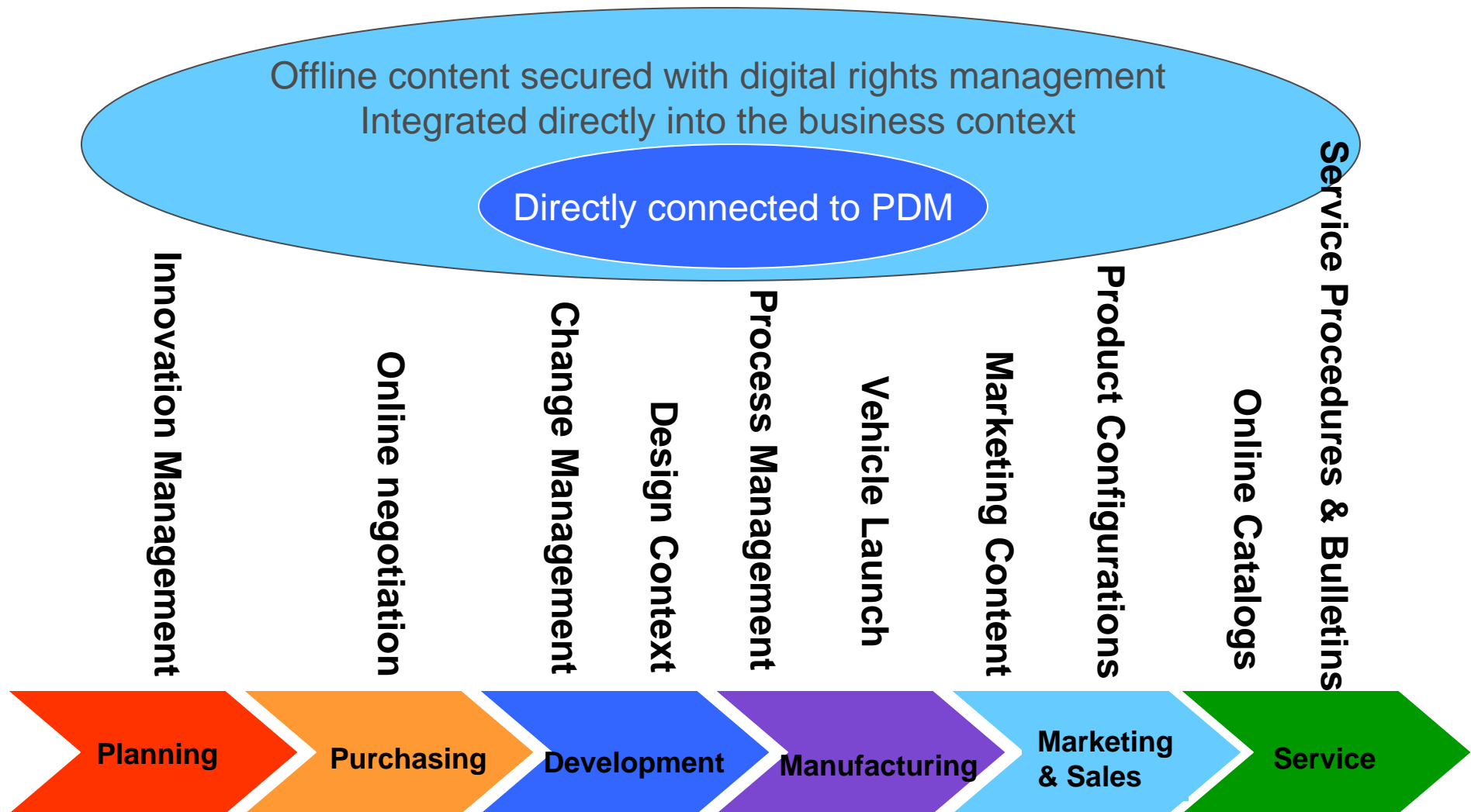
- External community development
- Internal community development

## **2.Enabling Community-driven improvements in:**

- Knowledge Creation
- Innovation
- Problem-Solving
- Problem Prevention
- Leadership (Decision-making)
- Efficiency
- Knowledge Retention



# Collaboration between Business Units



## Key Messages:

- Need to be able to extend the reach of our 3D data securely while integrating it directly into specific business contexts



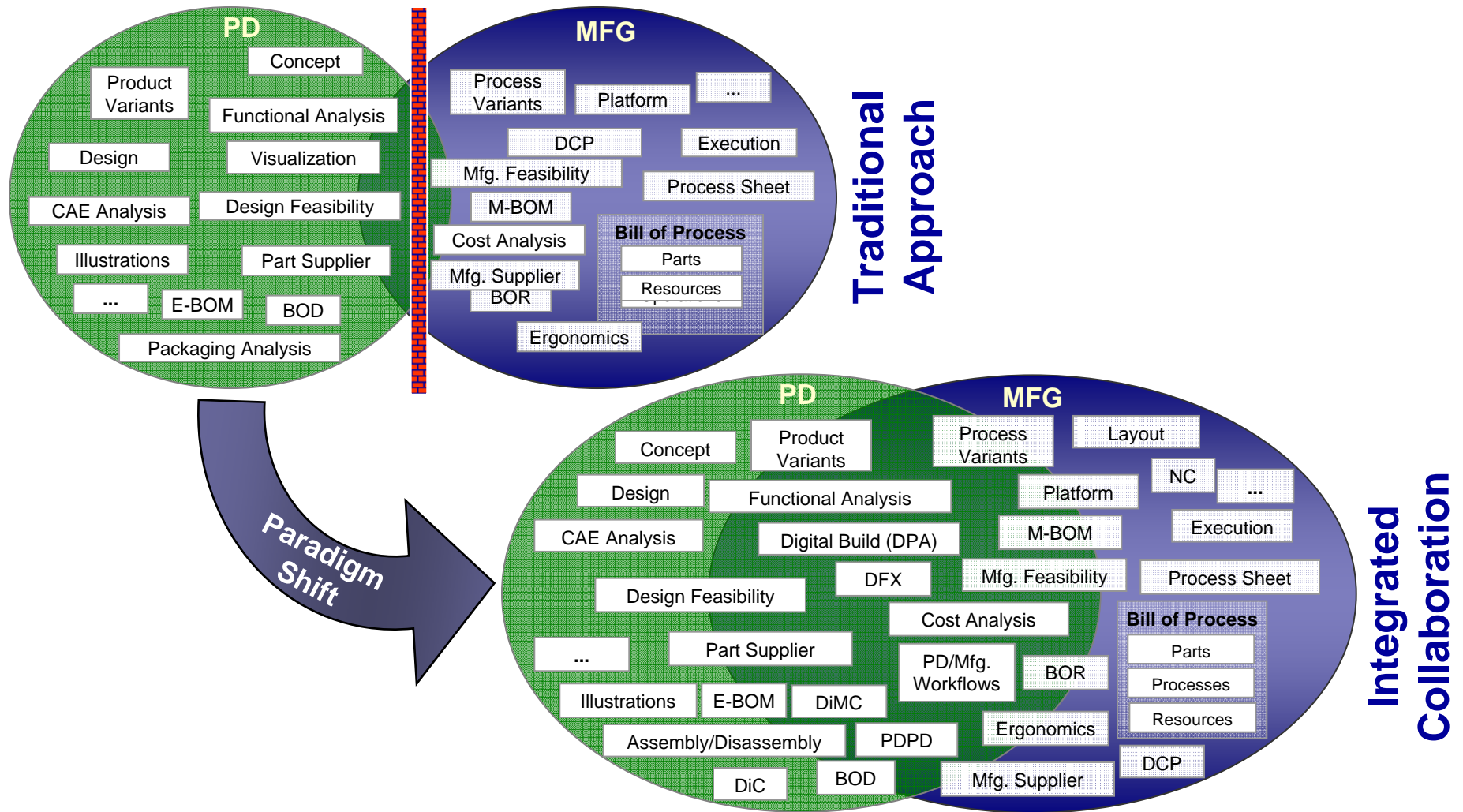
# Collaboration between Cross-Functional Teams



## Key Messages:

- Build environments that are flexible enough to support a variety of uses on a common platform

# Collaboration between Product Development & Manufacturing



## Key Messages:

- Seamless global collaboration across all organizations
- Design driven cost optimization through front loading of downstream knowledge
- System engineering approach of integrated product development process



# Collaboration for Product / Process Compatibility

## Process Driven Product Development:

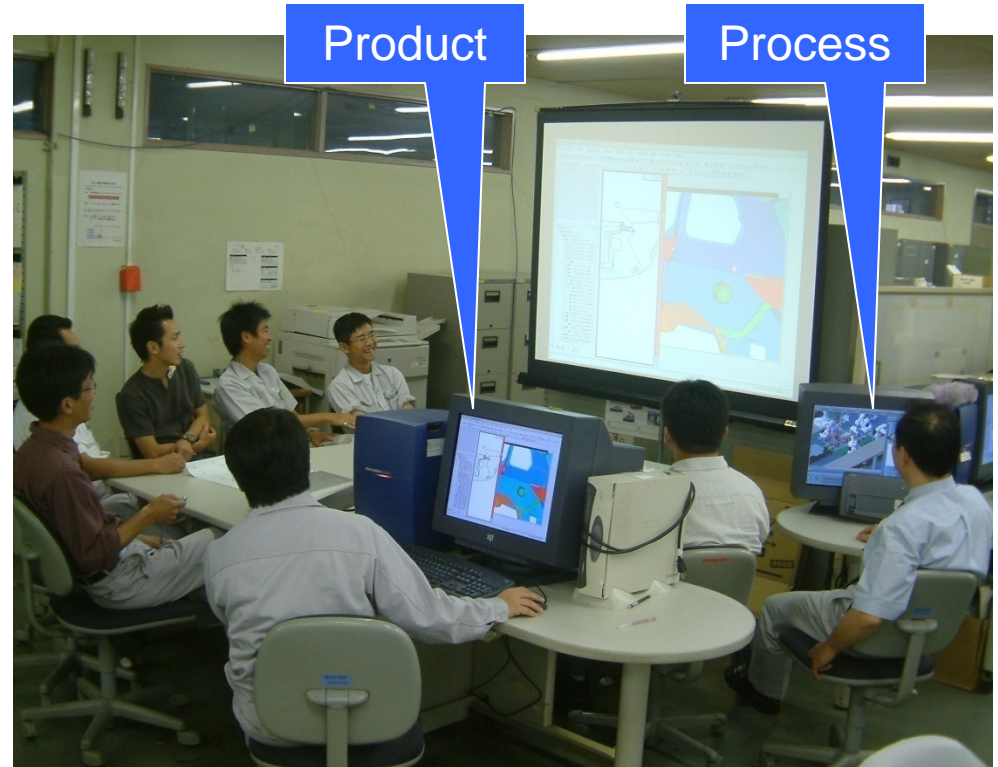
Geometric compatibility between product design and manufacturing process / facility & tools utilize 3D graphics and simulation technologies

“Virtual Build” events may be formal program milestones with the participation of senior management, or small informal desk-side meetings to quickly resolve an issue prior to any hard construction

Plants and suppliers may participate via remote interactive screen sharing sessions

The use of 3D visual technologies have proven valuable for both issue avoidance, and for clear communication at 1/10 the cost of 2D paper processes

Laser scanning and live video up-links are being increasingly used to bring plant information back to engineering



## Key Messages:

- 3D based communication brings substantial efficiency to cross organization and long distance design reviews

# Collaboration with Suppliers Through Data Portals

## Supplier Data Delivery Tracking:

Body tooling suppliers deliver virtual representations prior to and evolving with physical tools

Portals provide a means to track and collaborate “offline”. Much of this engineering information is NOT 3D (e.g. part version and life cycle state)

The state of the design can be quickly assessed, and the impact of potential part changes evaluated without disrupting the supplier

Similar collaboration is being used through our enterprise PLM system between PD and Manufacturing, where relevant manufacturing facility/tool/resource and process data are linked to parts, and may be traced through by PD

The screenshot displays the Ford Digital Factory interface. It includes a left sidebar with a tree view of the product structure, a central 3D model of a vehicle body, and a right sidebar with various data fields and tables. Callout boxes highlight specific features: 'Area & Plant' points to the 'Mfg plant' field; 'linked to 3D viewer' points to the 3D model; 'Fixture Details' points to the 'Description' field; 'Lines, Stations, and Fixtures' points to the 'Station-200' entry in the tree view; and 'Part version and life cycle state' points to the 'Used Version' table.

**Area & Plant**

**linked to 3D viewer**

**Fixture Details**

**Lines, Stations, and Fixtures**

**Part version and life cycle state**

Version	Rev.	Life Cycle State
125	Ad	RELEASED-P

Version	Rev.	Life Cycle State
126	Ad	Design Intent
129	Be	RELEASED-P
130	Be	Design Intent
138	Cf	Design Intent
139	Cf	RELEASED-P
140	Cf	Design Intent
141	Cf	Design Intent

## Key Messages:

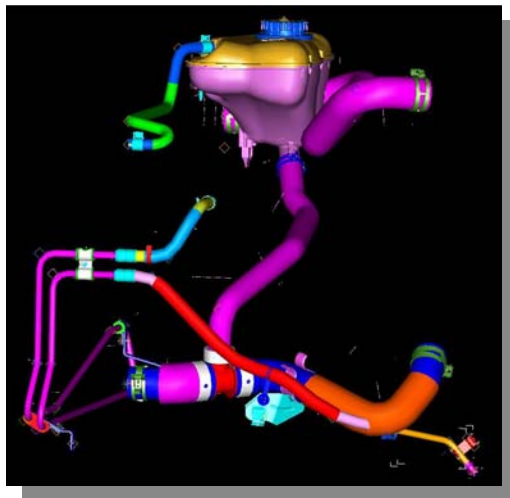
- Portals provide a traceable record of communication with data that can be utilized at any time
- Caution should be exercised to prevent uneducated browsing from leading to wrong conclusions



# Collaboration with our Supply Chain

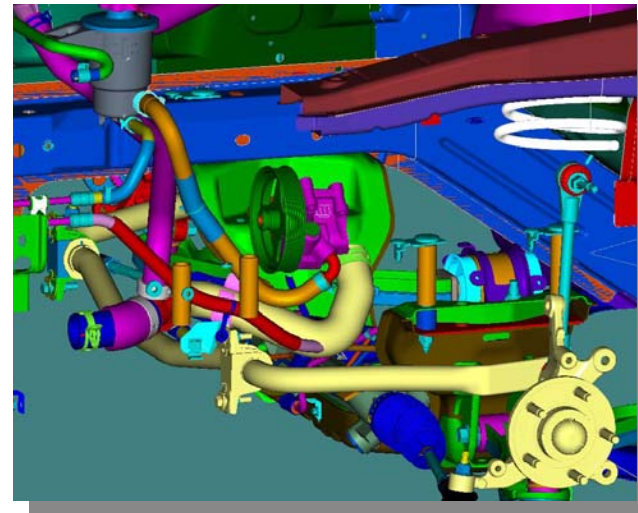
## Design in Context: The Challenge for Suppliers

A small set of parts to design:



- 11 End Items
- 80 CAD Files, 399 Versions
- Average of 0.44 versions per day

In an extremely complex environment:



- 43 Assemblies, 2424 Versions
- Average of 1.73 versions per day
- ~30 minutes per download
- 4.3 hours per week for downloads

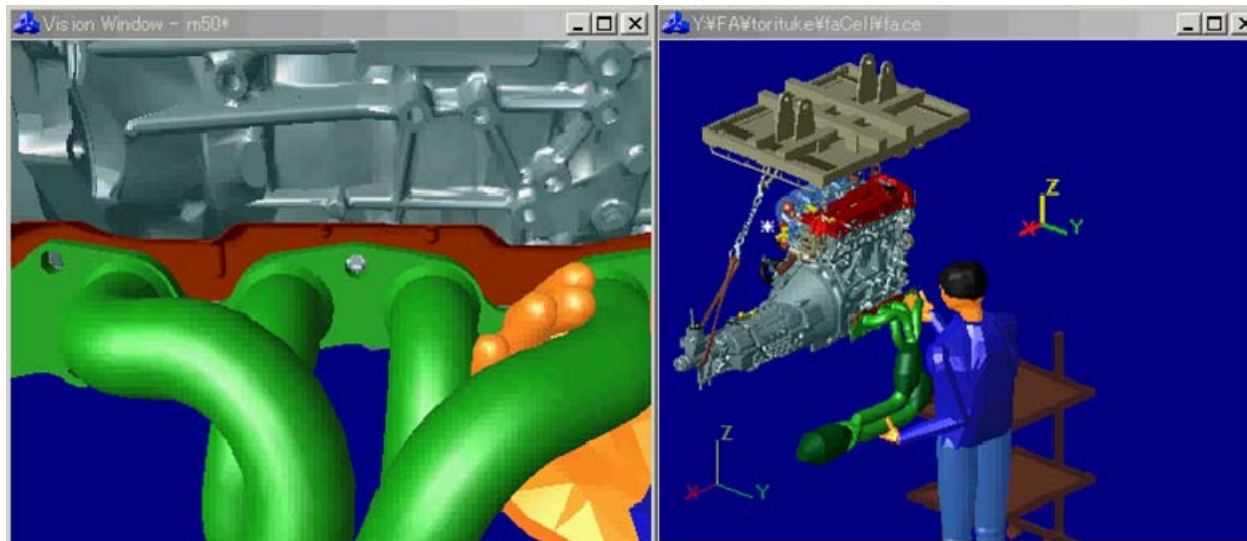
### Key Messages:

- Increase the utilization of lightweight visualization as an alternative to CAD
- Improve the ability to conduct online design reviews
- Reduce the barriers that inhibit the direct integration of external design teams

# Collaboration for Problem Prevention

## Diffusion of Best Practices:

By capturing and presenting lessons learned in more dynamic, interactive, and accessible ways we lower the learning curve associated with mastering new engineering and manufacturing techniques. The result is more trouble avoidance and less trouble-shooting.

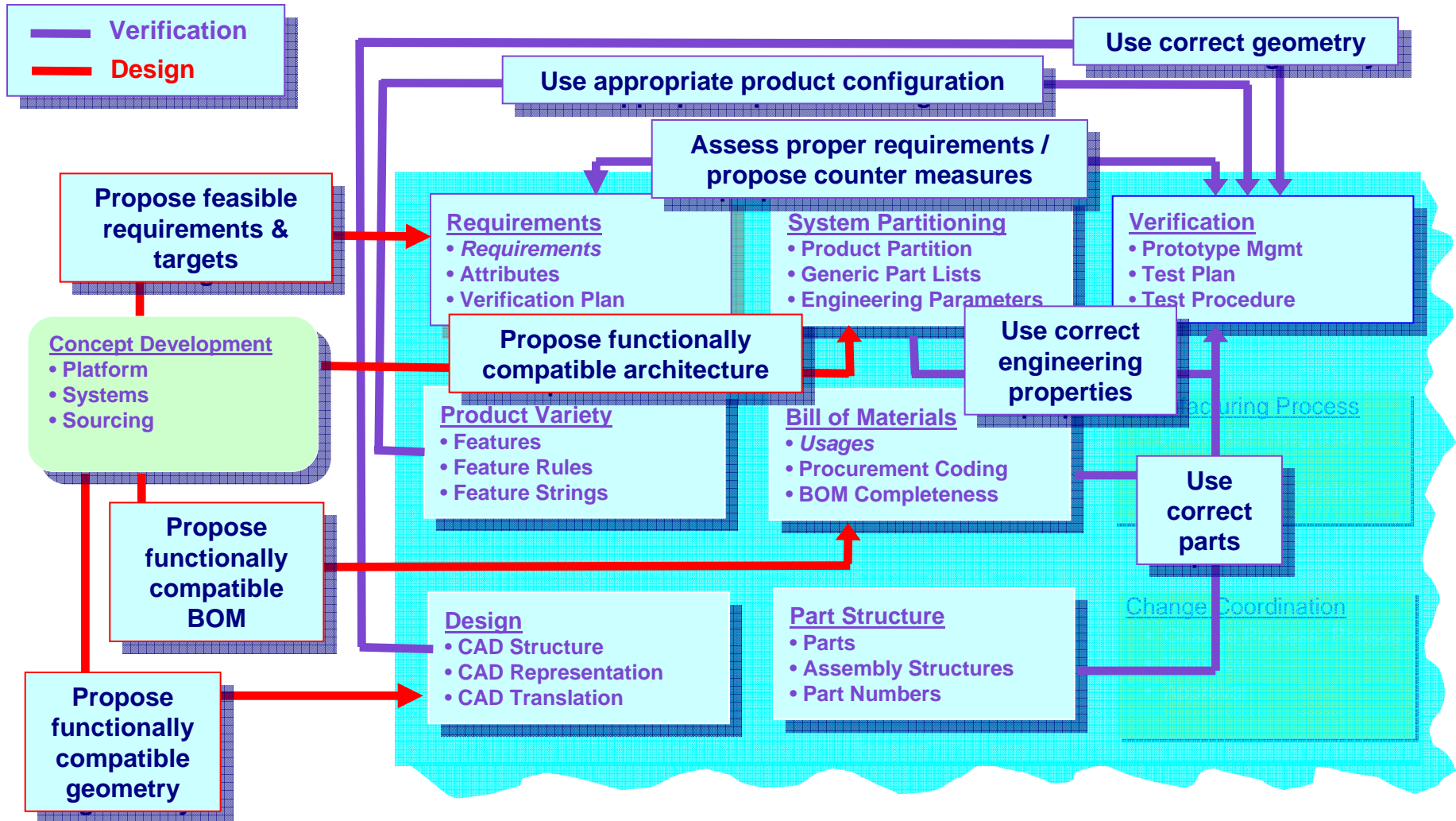


## Key Messages:

- Technology does not have to be leading edge to improve problem prevention , strategic use of pictures, audio, video and other content can greatly reduce errors when aligned with a comprehensive collaboration vision



# Collaboration for Design Development & Verification



## Key Messages:

- Seamless global collaboration across all organizations
- Support critical Engineering Information interactions
- Enable Tradeoff between competing requirements and design options

# Collaboration for Efficiency (Complexity Reduction & Commonality Promotion)

Maximize the reuse of proven existing parts, assemblies, equipment and process

## INNOVATE MORE

Give engineers more time to engineer by reducing the re-invention of proven designs

## MOVE FASTER

Rapidly ramp up new product development through commonization strategies

## GO GLOBAL

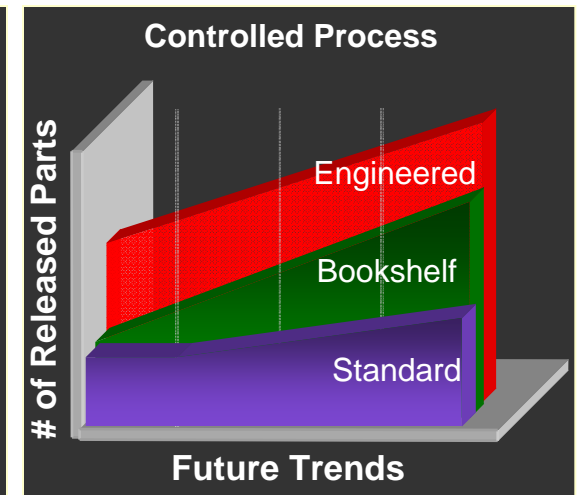
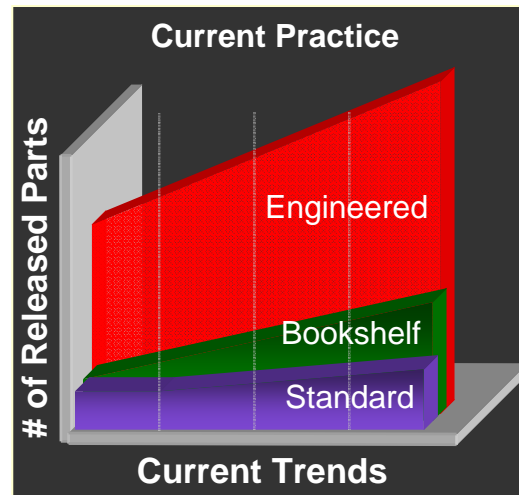
Standardize components from within the global value chain

## REDUCE COMPLEXITY

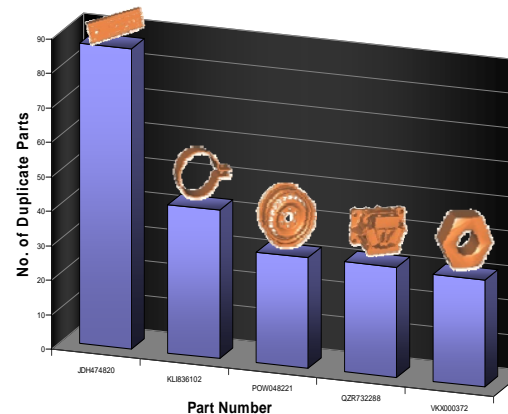
Leverage existing components in multiple products to reduce development & part costs

## BE COMPLIANT

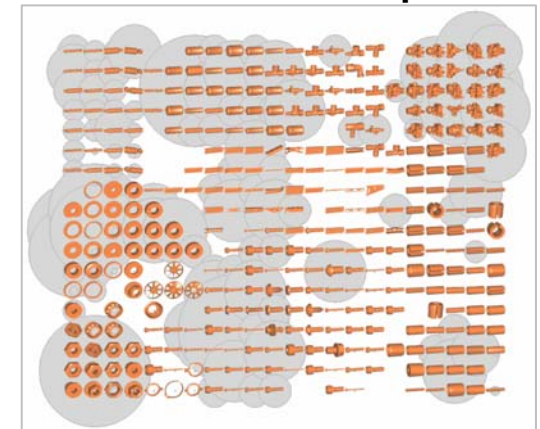
Eliminate validation activities by utilizing previously certified parts



## Duplicate Part Analysis



## Part Cluster Map

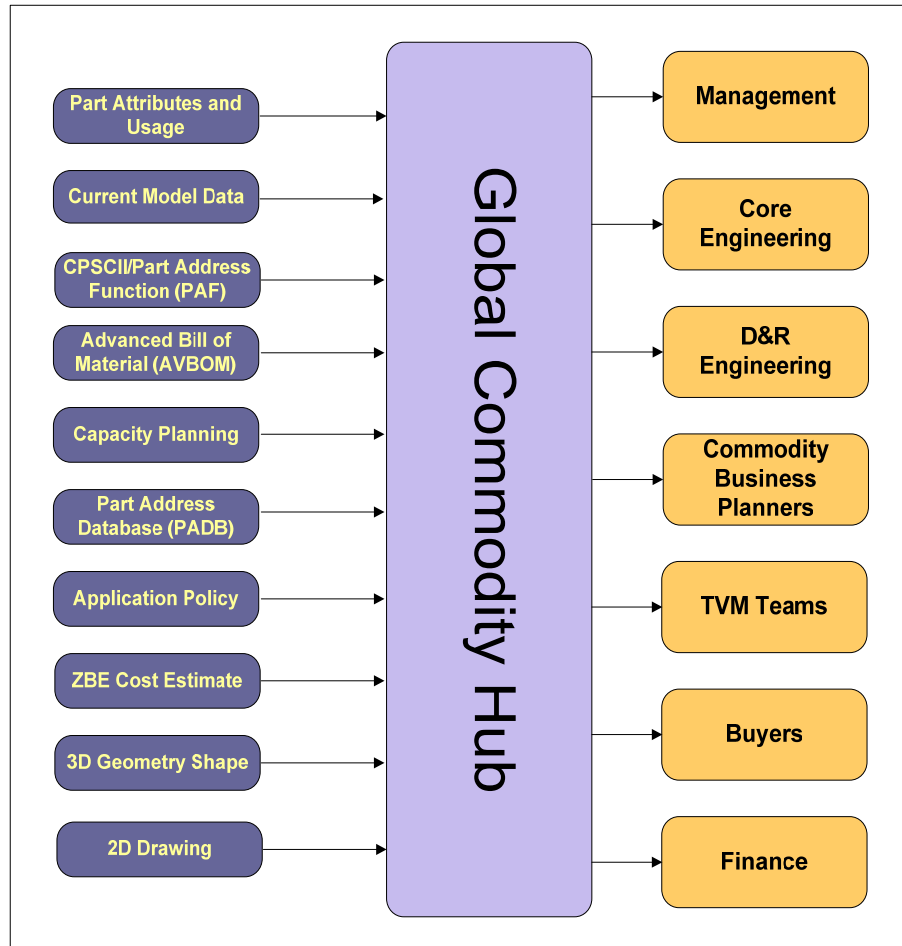


## Key Messages:

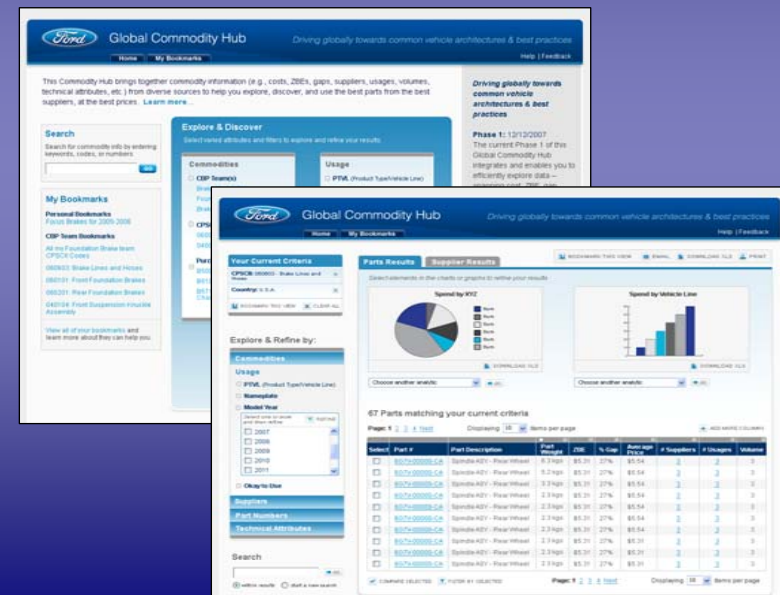
- Promote commonality without sacrificing innovation
- Consistency in quality (reduce noise and variations), Increase first pass success, reduce system cost



# Collaboration for Process Integration Across Functions



Automatic federation of critical commodity information and an easy to navigate view of various attributes, data, and metrics, along with the basic analytical capabilities



## Key Messages:

- Enable cross-functional analysis and decision support for business workflows
- Drive enterprise wide investment decisions, rather than program-based decisions
- Decrease part proliferation and improve corporate commonality metrics



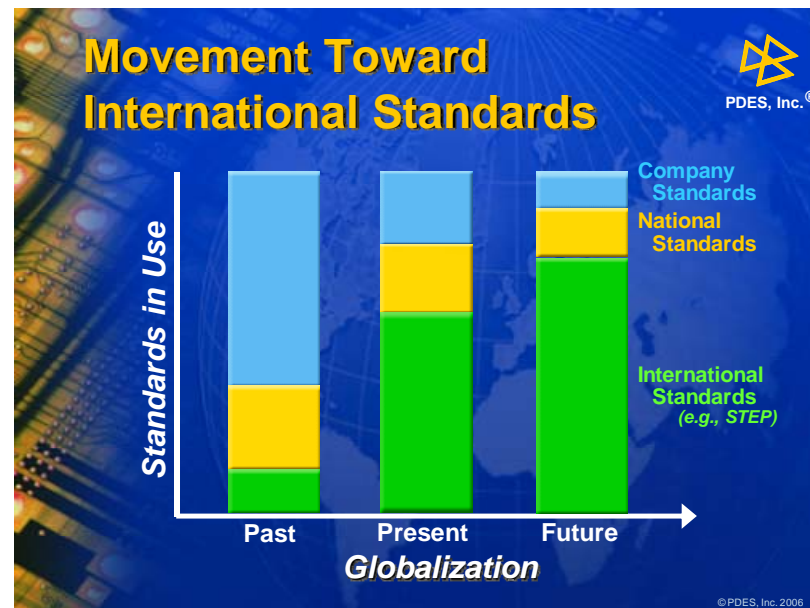
# Collaboration for Tool & Systems Interoperability

## Interoperability Challenges:

- Lack of interoperability between tools
- Information loss during transfer from system to system
- Differences in underlying information models
- Multiple standards require translations
- Manual information entry is prone to errors

## Implementation of Standards:

- Standards such as PDX work for limited scope/scale
- But – which standards to converge on?



## Adaptive Interface Development:

- Semantic approaches can be implemented to reduce the reliance on standards
- But not sufficient agreement on upper ontologies for collaboration yet

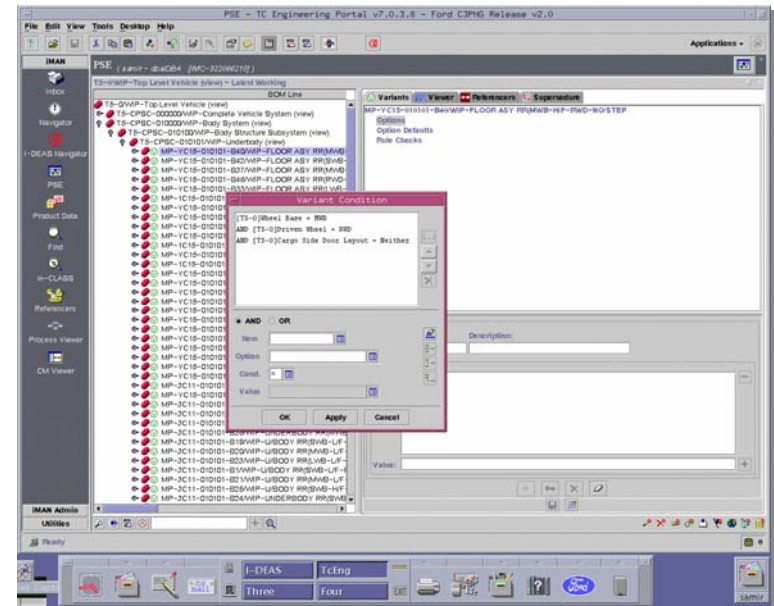
## Key Messages:

- Standards are critical
- Adaptive Interfaces must be leveraged for “Plug & Play” functionality

# Collaboration for Process Interoperability

Implemented *Early Bill of Material System* as a collaborative improvement over the use of spreadsheets

- EBOM serves as a single shared authoritative source that offers:
  - Format Consistency
  - Up-to-date BOMs
  - Easy BOM publishing
- Enabled improved collaboration with extended enterprise business partners
- Supports a variety of uses on a common platform

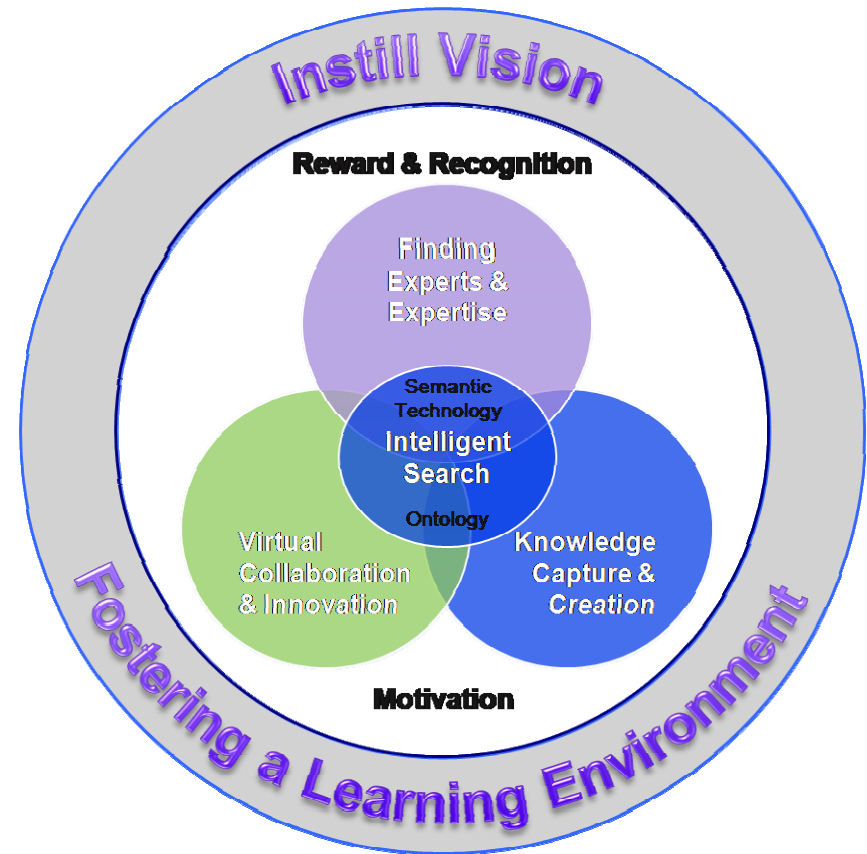


## Key Messages:

- Enables the design of context into Early BOM Systems

# Collaboration on Corporate Learning

- Make **enterprise knowledge** available
  - Finding Experts & Expertise
  - Intelligent Search with Semantics
- Accelerate **virtual collaboration & innovation**
  - Community Driven Problem Solving & Prevention
  - Knowledge Powered Innovation & FMEA
- Formalize **knowledge capture & creation**
  - Tacit Knowledge Transfer
  - Knowledge Circles (social networking)
  - Knowledge Preservation



## Key Messages:

- Fostering a learning-enabled organization for knowledge creation, discovery & innovation
- Corporate learning is supported and enhanced by making the community an active participant

# Collaboration for Knowledge Retention

The arrival of a knowledge-based economy has made *knowledge asset management* more critical as a competitive and survival necessity.

Ford is enabling knowledge capture and retention via social tools that personalize virtual interaction.

Dashboard > Fordipedia > Home



Home



Welcome to Fordipedia, a user-created reference on all things Ford. Search just this space using the box below, or read on to learn about other ways to use Fordipedia.

Dashboard > Knowledge Network > Ford Knowledge Network - Home

Knowledge Network

Ford Knowledge Network - Home

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Labels: (None) [EDIT](#)

### Ford Knowledge Network

- The Ford Knowledge Network was created to encourage and inspire more robust knowledge creation, more complete knowledge retention, and more effective collaboration between people, units, processes, and systems.
- A goal of the Ford Knowledge Network is to provide all users with "an executive's view" of the company to encourage and enable greater cross-organizational awareness and participation.
- However, the most important and exciting aspect of the Ford Knowledge Network is YOU. The Ford Knowledge Network (FKN) is an encyclopedia of Ford knowledge that was envisioned and designed to enable you to create your own encyclopedia entry - about your contributions to the history, present, and future of Ford.
- We are all editors and developers of this system, and together we can make the Ford Knowledge Network representative of the best of us all, and a powerful resource for Job 1, making the best vehicles in the world.

[Ford Brands](#)  
[Ford Operations](#)  
[Ford Terms](#)

Searching Knowledge Network:

#### Today's featured article:

**A Message From Mark Fields: New Products will drive Ford success in 2008**

Welcome to 2008. It's a new year, and Ford Motor Company is ready to build on the momentum our team delivered throughout

#### In the news:

**Canadian truck sales up for 2007**

Although overall sales were down 2.2 percent for the year, there was plenty of good news for Ford Motor Company of Canada in 2007. Total truck sales were 8.8 percent, the F-Series was the best-selling vehicle in Canada for the fifth straight year and the top-selling pickup for the 42nd consecutive year, total Ford SUV sales were up 36 percent, Lincoln sales were up 39 percent, and the Escape and Mustang were the sales leaders in their segments. This added up to 224,356 sales for the year: 56,147 cars and 168,209 trucks. For December, which saw total Ford sales decline 11.8 percent to 15,163 units, highlights included sales increases for the Ford Edge, Ford Ranger and Lincoln MKC.

**Volvo C30 wins 2008 Automobile All-Star award**

The Volvo C30 has been named a 2008 *Automobile Magazine* All-Star, becoming the first Volvo ever to win this prestigious award. "The smoothly chic, Scandinavian cool, four-seat hatch," is how Jean Jennings, editor-in-chief of Automobile Magazine, described the C30, adding: "The Volvo is whisper-quiet,

## Wiki-based Knowledge Retention & Reference Systems

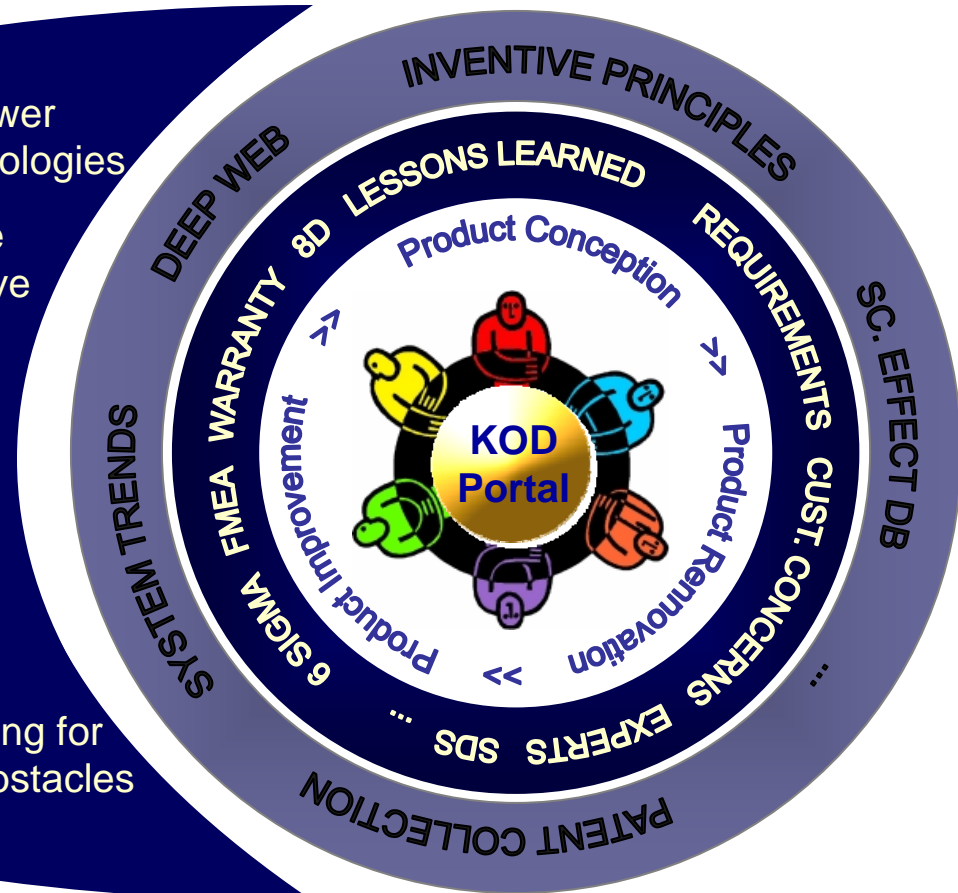
### Key Messages:

- Successful collaboration involves a mix of enablers to empower people to develop relationships more "naturally"
- Internal knowledge stores are greatly enhanced by making knowledge capturing unobtrusive



# Collaboration for Innovation

- Automate & empower innovation methodologies
- Leverage collective intelligence by participative and collaborative approach of problem solving
- Enhance the innovation creativity with structured and repeatable processes
- Enable comprehensive problem understanding and conceive more & better ideas/solutions
- Enable creative thinking for defeating technical obstacles



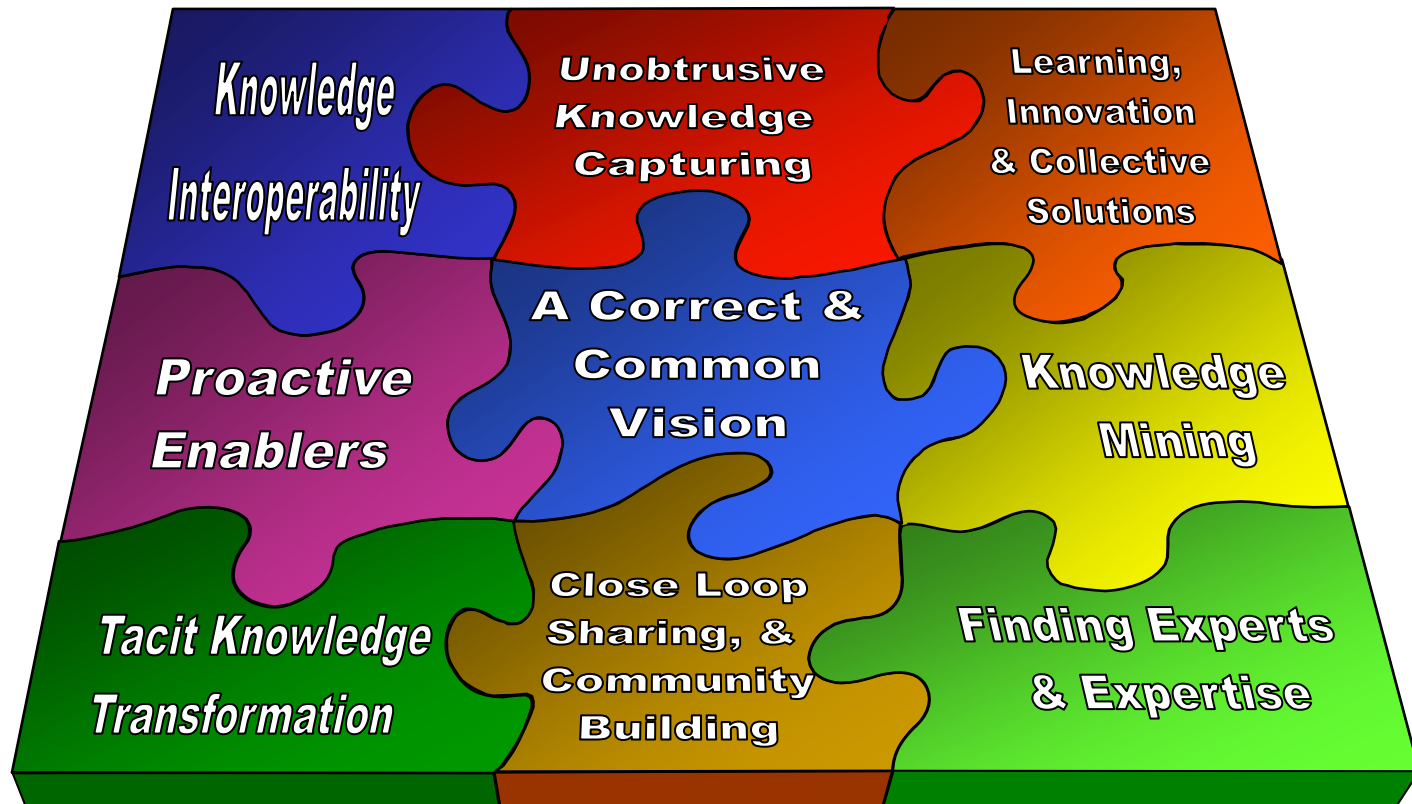
## Key Messages:

- **Structured Innovation:** Repeatable processes to conceive more high-quality ideas & solutions
- **Knowledge Enabled Innovation:** Precision research and integrated knowledge accessed from multiple sources
- **Collective Innovation:** Collectively leverage corporate expertise & external technical sources



# Collaboration for Leadership

Ford's collaborative environment is attached to a set of goals & principles intended to incorporate collective wisdom into solutions and decision-making

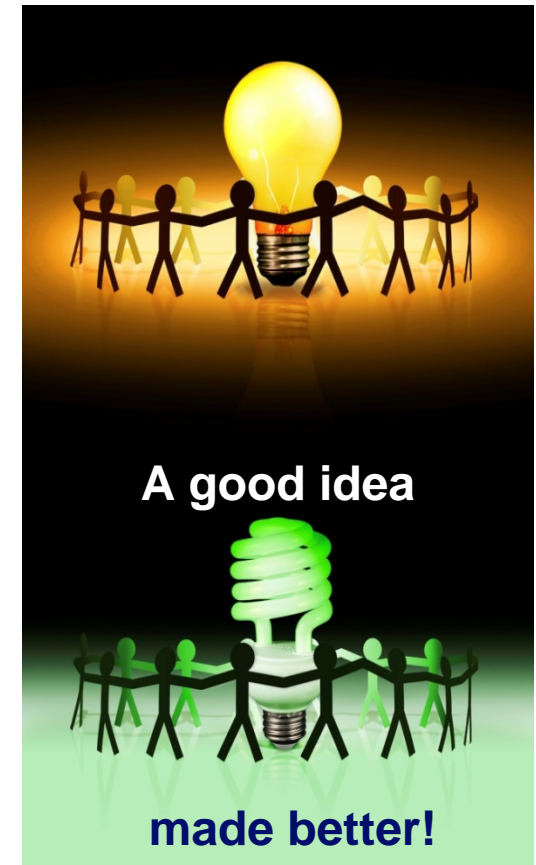


## Key Messages:

- Ford's goal is to make the Knowledge-on-Demand to our people and processes richer, more "knowledge-ready", and reliable for accurate decision-making
- Collective intelligence creates better leadership

# Summary

- Superior products are defined by consumers
- *Openly available* and *equally accessible* information has enabled greater competition from competitors large and small, making collaboration and other efficiency measures more critical.
- Collaboration activities should be inclusive of the inputs of those affected by the collaboration effort, including suppliers and those in the marketplace, whenever possible.
- Collaboration efforts should be aligned and coordinated around a common enterprise vision to avoid a “clash of collaboration efforts”.
- Standards are critical to improve global collaboration
- Adaptive interfaces must be leveraged for interoperability



Thank You



**Flex**

**Coming Summer 2008**

Seating for up to seven

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Refrigerated console \*

Two-tone roof\* \*Available

