Siemens PLM Connection

Teamcenter for High Tech and Electronics
Agenda

Business solution summary

- Strategic Product Planning
- Virtual Product Development
- Environmental Sustainability

Teamcenter for high tech and electronics

What’s New in Teamcenter for HTE?
Business Solutions
for the High Tech and Electronics Industry

Strategic Product Planning
- Customer Needs Management
- Portfolio Optimization
- Program Execution Management
- Platform Planning and Design

Virtual Product Development
- Whole Product Management
- Integrated Product Development
- Digital Validation
- Global Collaboration

Environmental Sustainability (Green)
- Material and Substance Analysis and Reporting
- Environmental Stewardship
- Energy use and Carbon Footprint optimization
What’s New for high tech and electronics?

- Teamcenter unified architecture embeds Project and Requirements management into one platform.
- Vendor Part Management
  - Support for Commodity part management in electronics designs
- Reference Designator Management
  - ECAD Design BOM support for reference designators, find numbers
- PCB Visualization
  - PCB and Schematic viewing
- PDX Export
  - Standards based data export capability
Other capabilities of value to high tech and electronics companies...

**ECAD design and process**
- Teamcenter ECAD tool integration (Cadence, Mentor…)
- PCB Exchange with NX (physical models in Teamcenter)
- FlexPCB design in NX

**Physical system design and modelling**
- Motion Control systems in NX6 – Simulink, MatLab
- Thermal, Flow and Vibration analysis

**Software Management**
- Software source code management with Clearcase integration
- Embedded software management for multi-controller systems
- Rhapsody integration for MDD

**Product and Process**
- Platform planning and configuration
- Change and Workflow
- Documentation
- etc…
Systems Engineering & Requirements Management

Customer Needs Management
- Unified Requirements Management
Portfolio, Program & Project Management

**Portfolio Planning**
- Decision Support for NPDI

**Program Execution Management**
- Phase-Gate
- Project driven Workflow
Engineering Process Management

- Change Management
- Process Workflow
- Electronic Signoff
Bill-of-Materials Management

New Features
- PCB Reference Designator Support

Existing Features
- Configuration views and context
  - As-designed and built
  - Effectivity
- Platform Design
- Options and Variants
- Modules
- Variant BOM
- Model Hierarchy
Reference Designator Support (new)

Needed for PCB BOM management
- Find numbers
- Reference designators
- Validation
- Packed-unpacked view
- Occurance based
- Search
- BOM compare enabled
Initial Structure
Entering Duplicate Value…

[Software Interface]

- Quick Links: Customize
- Open Items
- Getting Started
- My Teamcenter

BOM Line | Find No. | Quantity | Reference Designator | !!!NoPack | Make... | Unit
---|---|---|---|---|---|---
000842/A;1-root (view) |  | 10 | R1 | None | each
000842/A;1-resistor | 10 | 10 | None | each
000842/A;1-capacitor | 20 | 20 | None | each
000842/A;1-connector | 30 | 30 | None | each

Communication Monitor

Incident count: 77 (App=PSEApplication) (DMS_CLIENT=ytump3f)
The last 50 calls happened in 0.662207 seconds.
On a customer WAN with 0.2 second latency, this could be 10.662207 seconds.

<table>
<thead>
<tr>
<th>Call time</th>
<th>Call made</th>
<th>Duration</th>
</tr>
</thead>
</table>

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Error message

Duplicate value for reference designator.

OK
Bad Format

![PSE - Teamcenter 2007 software interface](image)

**Getting Started**

<table>
<thead>
<tr>
<th>BOM Line</th>
<th>Find No.</th>
<th>Quantity</th>
<th>Reference Designator</th>
<th>!!!NoPack</th>
<th>Make...</th>
<th>Unit C</th>
</tr>
</thead>
<tbody>
<tr>
<td>000842/A:1-root (view)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000843/A:1-resistor</td>
<td>10</td>
<td></td>
<td>R1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000843/A:1-resistor</td>
<td>10</td>
<td></td>
<td>R1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Communication Monitor**

Server Call Chattiness Monitor

- Incident count: 80 (App=PSEApplication) (DMS_CLIENT=ytump3f)
- The last 50 calls happened in 0.404310492 seconds.
- On a customer WAN with 0.2 second latency, this could be 10.404310492 seconds.

<table>
<thead>
<tr>
<th>Controller</th>
<th>Call time</th>
<th>Call made</th>
<th>Duration</th>
</tr>
</thead>
</table>

---

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Error message

Value for reference designator is in wrong format.
Pack...

---

### Getting Started

**My Teamcenter**

- **PSE**: 000842/A:1-root - Latest Working - Date - "Now"

<table>
<thead>
<tr>
<th>BOM Line</th>
<th>Find No.</th>
<th>Quantity</th>
<th>Reference Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>000843/A:1-resister</td>
<td>10</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000843/A:1-resister</td>
<td>10</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>50</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>20</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000844/A:1-capacitor</td>
<td>20</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td>each</td>
<td>none each</td>
</tr>
<tr>
<td>000845/A:1-connector</td>
<td>30</td>
<td>each</td>
<td>none each</td>
</tr>
</tbody>
</table>

---

**Communication Monitor**

- **Server Call Chattiness Monitor**

Incident count: 84 (App=PSEApplication) (DMS_CLIENT=ytump3f)
The last 50 calls happened in 0.393948666 seconds.
On a customer WAN with 0.2 second latency, this could be 10.393948666 seconds.

Call time | Call made | Duration
--- | --- | ---

---

**PSE - Teamcenter 2007**

- **Quick Links**
  - Home
  - My Worklist
  - My Saved Searches
  - My Links
- **Open Items**
  - Getting Started
  - My Teamcenter
  - PSE
    - Schedule Manager
    - CAE SE
    - Validation
    - StructureMap Builder
    - DesignContext
    - CM Viewer
    - Organization

---

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### BOM Line Details

<table>
<thead>
<tr>
<th>BOM Line</th>
<th>Find No.</th>
<th>Quantity</th>
<th>Reference Designator</th>
<th>!!!NoPack</th>
<th>Make</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>000842/A:1-root</td>
<td>000813/A:1</td>
<td>10</td>
<td>R1 R2 R5</td>
<td>None</td>
<td>each</td>
<td></td>
</tr>
<tr>
<td>000844/A:1-capac</td>
<td>000844/A:1-capac</td>
<td>20</td>
<td>C1 C3 C4 C10</td>
<td>None</td>
<td>each</td>
<td></td>
</tr>
<tr>
<td>000845/A:1-connect</td>
<td>000845/A:1-connect</td>
<td>30</td>
<td>SK1SK1-SK1SK2-SK1SK4</td>
<td>None</td>
<td>each</td>
<td></td>
</tr>
</tbody>
</table>

---

**Communication Monitor**

- Server Call: Chattiness Monitor
- Incident count: 84 (App=PSEApplication) (DMS_CLIENT=ytump3f)
- The last 50 calls happened in 0.393948666 seconds.
- On a customer WAN with 0.2 second latency, this could be 10.393948666 seconds.

<table>
<thead>
<tr>
<th>Call time</th>
<th>Call made</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Change Find Number? No!

### PSE - Teamcenter 2007

#### BOM Line

| BOM Line | Find No. | Quantity | Reference Designator | !!NoPack | Mak... | Unit C...
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>000842/A;1-root (view)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000843/A;1-resister 10</td>
<td></td>
<td></td>
<td>R1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000843/A;1-resister 10</td>
<td></td>
<td></td>
<td>R2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000843/A;1-resister 10</td>
<td></td>
<td></td>
<td>R3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000844/A;1-capacitor 20</td>
<td></td>
<td></td>
<td>C1, C3, C4, C10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>000845/A;1-connect... 30</td>
<td></td>
<td></td>
<td>SK1SK1-SK1SK2-SK1SK4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Communication Monitor**

- Server Call Chatteriness Monitor
- Incident count: 84 (App=PSEApplication) (DMS_CLIENT=ytump3f)
- The last 50 calls happened in 0.393948666 seconds.
- On a customer WAN with 0.2 second latency, this could be 10.393948666 seconds.

**Call time**

<table>
<thead>
<tr>
<th>Call time</th>
<th>Call made</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Where is it?
Search for it!

Support wild card

Search Reference Designators

Reference Designator Value: SK1SK

!!!NoPack: True

Search Results

0 found.

Search Close
Too Many Results?
Packed Line? OK!
Compare Result

PSE - Teamcenter 2007

Getting Started My Teamcenter

BOM Compare Report - 000842/A:1-root (view) -> 000846/A:1-newRoot Single level (with find no) LH...

Item Id Item Name Find No Rev Qty
000842 A resistor 10 A->(1) 4<0
000845 connector 10 ()->A 0<4
000842 A resistor 30 ()->A 0<4
000845 connector 30 A->(1) 4<0

BOM Compare
Mode: Single level (with find no)
Report: check

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Result If Packed
Entering Quantity When Reference Designator Is Populated
Assign Reference Designator When Quantity Is More Than 1

<table>
<thead>
<tr>
<th>BOM Line</th>
<th>Find No.</th>
<th>Quantity</th>
<th>Reference Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>000842/A;1-root (view)</td>
<td></td>
<td></td>
<td>R1</td>
</tr>
<tr>
<td>000843/A;1-resister</td>
<td>10</td>
<td>8</td>
<td>R2</td>
</tr>
<tr>
<td>000843/A;1-resister</td>
<td>10</td>
<td>10</td>
<td>R3</td>
</tr>
<tr>
<td>000843/A;1-resister</td>
<td>10</td>
<td>10</td>
<td>R5</td>
</tr>
<tr>
<td>000844/A;1-capacit</td>
<td>20</td>
<td>4</td>
<td>C1,C3,C4,C10</td>
</tr>
<tr>
<td>000845/A;1-connection</td>
<td>30</td>
<td>4</td>
<td>SK1SK1;SK1SK2;SK1SK4;SK1S...</td>
</tr>
</tbody>
</table>
Error!

Quantity can only be blank or 1 if reference designator is assigned.
Environmental Stewardship
- Teamcenter for Environmental Compliance
  - Regulatory reporting
  - RoHS
  - WEEE
  - REACH
  - Material and Substance Management
Supplier Relationship Management

New Features
- Vendor Management
  - Vendors
  - Commercial Parts
  - Vendor Parts
  - Vendor Qualification
  - Bid Packages
- PDX Export
- IPC Standard format
Vendor and Vendor Part management

Vendors can be qualified for parts they provide
Vendor Parts represent parts provided by a Vendor (their number)
Commercial Parts represent internal parts used in designs (company number)
Create Vendor

- Specify Vendor ID and Name
  - ID can be entered or auto-generated
  - Vendor is created without BMIDE deployment
  - Vendor ID and Name supports spaces, commas, &, _, ., -, @, #, (, ), "", ', !, <, >.
Create Commercial Part

- Specify Internal Part ID and Name
Create Vendor Part

- Specify Vendor’s Part Number, Name, and Vendor ID
  - Vendor ID can be selected from search
  - Vendor is automatically related to new Vendor Part
  - Relation to vendor cannot be changed after creation
Vendor Part ID and Vendor Part Number

Vendor part ID = <Vendor Part Number>-<Vendor ID>

- Vendor Part ID is automatically generated
Teamcenter Does Not Allow Duplicate Vendor Part Numbers for a Vendor

![Image of Teamcenter software interface showing a warning message about duplicate vendor part numbers.](image-url)
Teamcenter Allows Duplicate Vendor Part Numbers from Different Vendors
Navigation Between Vendor Part and Vendor

- Use pseudo folders to navigate between related objects
Columns are configurable. Any properties on the listed objects may be included.
Viewing Details of Related Vendor Parts
Viewing Related Vendor Parts in PSE

- Use attachments tab to view related vendor and vendor part data
Relate Vendor Part to Multiple Commercial Parts

- Drag / Drop or Cut / Paste vendor parts to pseudo folders on one or more commercial parts
- Operation also supported on pseudo folders of vendor parts (i.e. drop commercial part on vendor part)
- Relations may be removed by ‘cutting’ items from folders
Create Vendor Part Directly for Commercial Part

- Select commercial part pseudo folder
- Create new vendor part
- Vendor part is automatically related to selected commercial part
View / Edit Preferred Status

- Select option from context menu
- Dialog is presented with related parts and statuses
- Statuses may be edited

Preferred Status

<table>
<thead>
<tr>
<th>Commercial Part ID</th>
<th>Revision ID</th>
<th>Vendor Part</th>
<th>Preferred Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>000001</td>
<td>A</td>
<td>vp7-Motorola-partname</td>
<td>Preferred</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vp8-Samsung-partname</td>
<td>Backup</td>
</tr>
</tbody>
</table>

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• Use a release workflow
• Release status is attached and part is frozen
Revise Commercial Part

- Revise: A -> B
- Vendor part relations are copied to new revision

- Vendor parts may be added or removed from rev B
Configure Vendor Part Search in Query Builder

- Admin configures search criteria and saves
Users may search by any attribute of vendor part and related vendor (part number, name, vendor ID, etc) as configured by admin.
Subtypes of Commercial and Vendor Part

Subtypes of Commercial and Vendor Part are supported in the UI.
Supplier Collaboration
PDX Export

Needed for PCB BOM management
What / Why PDX?

• In order to exchange the information across the supply chain there should exist a common format that is understood by all the stakeholders in the supply chain.

• Product Data eXchange (PDX) is a standard for the e-supply chain in the HTE market.

• Product Data eXchange is an ANSI-approved multi-part standard, represented by the IPC 2570 series of specifications.

• As part of this project Teamcenter would be providing the users with the capability to export Teamcenter data as a PDX package.
1. Configure the system for PDX Export
2. Export the data as PDX and create a PDX package
3. Send the PDX package to suppliers
4. Work on any changes if required
5. Any changes go through a change process.
6. The PDX package is regenerated.
7. Resend the data to suppliers
8. Suppliers complete their work using the latest PDX package
9. Query for a PDX package that is created in Teamcenter and view it.
10. Access PDX package from external applications
## Use Case flow

<table>
<thead>
<tr>
<th>Step</th>
<th>User Action</th>
<th>System Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Administrator interacts with Preferences to set PDX export processing parameters</td>
<td>System stores preferences</td>
</tr>
<tr>
<td>1b</td>
<td>Administrator defines PDX Recipe (known as transfer mode and closure rules) via Rich Client Administrative UI</td>
<td>System stores PDX Recipe</td>
</tr>
<tr>
<td>2a</td>
<td>User sets configuration and revision rules for PDX export</td>
<td>System stores configuration and revision rules</td>
</tr>
<tr>
<td>2b</td>
<td>User can review (leverage) pre-defined PDX Recipes</td>
<td>System displays list of pre-defined PDX Recipes</td>
</tr>
<tr>
<td>2c</td>
<td>User selects desired PDX Recipe</td>
<td>System stores desired PDX Recipe</td>
</tr>
<tr>
<td>2d</td>
<td>User submits request to generate PDX Package</td>
<td></td>
</tr>
<tr>
<td>2e</td>
<td></td>
<td>The system processes the request in the background</td>
</tr>
<tr>
<td>2f</td>
<td></td>
<td>The system associates the PDX Recipe with the PDX Package that is created and stored in Teamcenter</td>
</tr>
<tr>
<td>2g</td>
<td></td>
<td>The system notifies the user (via email) of the result of the PDX Package generation request.</td>
</tr>
<tr>
<td>3a</td>
<td>The user follows a email link to the PDX Package in Teamcenter (or searches) and then uses the UI to specify where to download the PDX Package</td>
<td>System downloads PDX Package to desired location on file system.</td>
</tr>
<tr>
<td>3b</td>
<td>The user transfers the PDX Package to the HTE supplier</td>
<td>The system moves the PDX Package</td>
</tr>
<tr>
<td>4a</td>
<td>The HTE supplier opens the PDX Package in a PDX Viewer</td>
<td>The PDX Viewer allows the user to navigate the PDX Package content and expand/collapse</td>
</tr>
</tbody>
</table>
Flow Chart

Start

Provide input data

Export Immediate?

No

Export request into the offhours queue

Yes

Export process in the background

Export request into the immediate queue

Export Successful

Yes

Mail Attachment

Successful mail

No

Stop

Failure Mail

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User Interaction – Export dialog

Select an object and invoke PDX Export dialog
User Interaction – PDX Package

The created PDX Package gets attached as a dataset to an envelope in users mail box.
Configuration

Site Selection

Stylesheet selection

<action name="dataTransfer">
<!-- Tc to Tc -->
<map source="1009598626" target="123456789">
<mapper service="XSLTMapService">
"MapControlFiles/Tc2PDX.xsl"
</mapper>
</map>

Recipe (Transfer Option Set) Selection

TC_gms_export_transfermode_for_IMC-12345678
TIEPDXExportDefault

Data Mapper in TcGS
### Closure Rule - TIEPDXExportDefault

<table>
<thead>
<tr>
<th>Primary Object</th>
<th>Secondary Object</th>
<th>Related Property/Relation</th>
<th>Action Type</th>
<th>Conditional Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>ItemRevision</td>
<td>Dataset</td>
<td>RELATION25</td>
<td>PROCESS</td>
<td></td>
</tr>
<tr>
<td>ItemRevision</td>
<td>*</td>
<td>RELATION25</td>
<td>PROCESS</td>
<td></td>
</tr>
<tr>
<td>ItemRevision</td>
<td>PSBOMViewRevision</td>
<td>ATTRIBUTE</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>PSBOMViewRevision</td>
<td>PSOccurrence</td>
<td>REFBY</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>PSBOMViewRevision</td>
<td>bom_view</td>
<td>ATTRIBUTE</td>
<td>PROCESS+T...</td>
<td>FUNC_ARGS(&quot;Samsung&quot;)</td>
</tr>
<tr>
<td>CommercialPart Revision</td>
<td>VendorIdentifier</td>
<td>FUNCTION</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>(IdContext)</td>
<td>Vendor</td>
<td>RELATIONS2P</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>VendorIdentifier</td>
<td>ManufacturerPart</td>
<td>ATTRIBUTE</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>VendorRevision</td>
<td>VendorRole</td>
<td>ATTRIBUTE</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>VendorRole</td>
<td>*</td>
<td>ATTRIBUTE</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>EngChangeRevision</td>
<td>BomChange</td>
<td>REFBY</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
<tr>
<td>EngChangeRevision</td>
<td>WorkspaceObject</td>
<td>RELATION25</td>
<td>PROCESS+T...</td>
<td></td>
</tr>
</tbody>
</table>
Multiple Object Selection

(Combination of Item, Part, Commercial part, BOM and duplicate Datasets)
### Change Object Export

#### 000056/A;1-Assy2 - Latest Working - Date - "Now"

<table>
<thead>
<tr>
<th>BOM Line /</th>
<th>Item Type</th>
<th>...</th>
<th>Quantity</th>
<th>Find No.</th>
<th>Make...</th>
<th>All Notes</th>
<th>Unit Of Measure</th>
</tr>
</thead>
<tbody>
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<td>Item</td>
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<td>000066/A;1-CP66 x 2</td>
<td>CommercialPart</td>
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<tr>
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#### 000056/B;1-Assy2 (view) - Latest Working - Date - "Now"

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<th>Quantity</th>
<th>Find No.</th>
<th>Make...</th>
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<td>1</td>
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Whole Product Management

- Cross discipline information management
  - ECAD PCB Integration
  - ECAD Visualization
  - Mechanical Integration
  - Software Management
Simulation Process Management

Digital Validation
- Simulation results management
Global Collaboration

- Ad-hoc reporting
- Dashboard views
Community Collaboration

Customer Needs Management
- Idea collection and validation
  - Surveys
  - Wiki, Blog, eMail

Extended Team Collaboration
- Vendor Portal
- Distributed stakeholders
- Executive dashboards
- Virtual meetings
Enterprise Knowledge Management

Document management
Information search
Shape search (Geolus)
Classification
Contact

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