NX – Reducing the cost of innovation

NX Strategy Update – Connections Austria– 2010

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Today’s Challenges

In today’s economic climate many companies are forced to:

- Deliver the same level of innovation with reduced resources

Or,

- In many cases increase levels of innovation with reduced resources

Our Goal…

Deliver you tools that increase your productivity, shortening product development workflows and enhancing integration throughout your entire process

Despite the current climate 63% of top executives rated Innovation a top 3 priority

*Boston Consulting Group*
Customer Driven Enhancements

With each NX release we continue to deliver an increasing number of customer driven enhancements.
Improving Design Workflow Productivity

Dramatically enhance user productivity and downstream integration by shortening common workflows and increasing manufacturing readiness.

- **Current Practices**
- **Opportunities**
- **Best Practices**

### NX 7.5 Design

**Creation**
- Immediate sketching
- 1-Pick positioning
- Sketch Groups
- Auto dimensioning
- Patterns in Sketcher
- Synchronous Sheet Metal
- Sketch Feature Dimensions
- Mirror Assembly Creation
- 3-Face Blend
- Advanced face blending
- Shape extraction from polygon mesh
- Smart Router

**Change**
- Healing imported geometry
- Geometric cases coverage
- Synchronous freeform
- Synchronous in multi-parts
- Improved Section Edit
- Fixed constraint
- Re-Chamfer (like re-blend)
- Dimension to pre-blend edge
- Recognize Shell on imported parts
- Region Finder for faces

**Mockup & Validation**
- TC / NX – IP Management
- Simple Lightweight Loading
- Associative Refs to Lightweight Reps
- Automatic Loading of B-Reps
- New Swept Volume Engine
- Associative Multi-CAD updates
- HD3D Conditional Formatting
- JT Editing – Open / Edit / Save
- Validation Reporting
- OOTB checkers with healing

**Reuse**
- 2D Reuse Library
- Copy & Paste inside and across sketches
- PTS - Support for Non-Master data: Drawings, Motion, FEA
- PTS - Improved logic using Visual Rules
- Increased Object type support
- More search options
- Simplified Classification to TC

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## NX – Continuous Innovation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Knowledge Fusion</td>
<td>Embedded knowledge engine</td>
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<tr>
<td>Design Logic</td>
<td>Simple access to parameters, measurements, formulas, and rules</td>
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<tr>
<td>Direct Modeling</td>
<td>Ability to modify geometry by directly manipulating model’s faces</td>
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<tr>
<td>New UI</td>
<td>Intuitive and consistent block-based UI design … reduced learning curve with most usability</td>
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<tr>
<td>Active Mock Up</td>
<td>Mock up and review capabilities integrated within the design environment</td>
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<tr>
<td>Synchronous Technology</td>
<td>New powerful technology… synchronization of rules, geometry and behavior for rapid product changes</td>
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<tr>
<td>Product Template Studio</td>
<td>Design automation … easy creation of reusable design templates</td>
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<tr>
<td>HD3D</td>
<td>Visual analytics … product and process information in a visually interactive environment</td>
</tr>
<tr>
<td>Rapid Design</td>
<td>Rapid product innovation … in an intuitive and natural way</td>
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NX 6 Design Momentum...

Synchronous Technology

- The power of history-based modeling with the speed and flexibility of Synchronous Technology
- Faster design creation and modification
- Always predictable results
- Ideally suited for Multi-CAD

User Interaction

- NX “Your Way” productivity from a UI that meets your needs

Teamcenter Integration

- Immediate access to Teamcenter with significant performance gains from 4-tier architecture

NX 6 has received positive reactions from you, our customers…
NX 7.5 … Focus on Productivity

**Design Efficiency**
Rapid design workflows for product layout and efficient design creation and iteration

**Visual Analytics**
Providing the right information for making the right decisions in the context of 3D designs

**Active Mockup**
Work in context of larger, and up to date assemblies with automatic lightweight loading

NX improving productivity throughout the entire development process
HD3D Vision
Addressing Decision Support Challenges

Correlate information of multiple disjoint data sources into a single visual interactive environment.
HD3D
Make the decision maker more productive
HD3D Visual Reporting
NX 7.5

Capabilities in NX 7.5
- Explore mode for investigating specific nodes in the assembly structure
- Report on one or more specific nodes within the assembly structure
- Active legend for selection & emphasis
- Save and retrieve visual reports from Teamcenter

Customer value
- Understand visual report results at various levels of the assembly structure
- Manage and distribute visual reports for design teams across the enterprise
HD3D Visual Reporting
NX 7.5 – Explore Mode

Capabilities in NX 7.5

- Explore Mode lets the user investigate specific nodes in the assembly structure.
- When entering Explore Mode, explore initially reports on all leaf nodes in the structure (with or w/o geometry).
- New Assembly Navigator columns display visual report information for all nodes in the structure: Report Group, Report Property, Results Below

Customer value

- Users visually navigate report results by controlling the nodes in the assembly structure that are emphasized

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HD3D Visual Reporting
NX 7.5 – Group to Explore

Capabilities in NX 7.5
- Group to Explore is used to set one particular group as ‘group of interest’.
- Nodes in the structure that match the group of interest are highlighted.
- All other nodes are deemphasized.

Customer value
- Emphasize and understand a particular group in visual report results
Capabilities in NX 7.5

- Report Down Assembly: Starts at the top level assembly and reports on the first nodes that match the group of interest.
- Press again to change to the next lower node that matches the group of interest.
- Assembly Navigator column ‘Results Below’ indicates when there are nodes that match the group of interest below a node in focus.

Customer value

- Quickly discover nodes in the assembly structure with a value of interest
Capabilities in NX 7.5

- Report on parts for one or more specific nodes in the assembly structure
- Select additional nodes to add or remove to the set of parts being reported on
- Report on Parent: Replaces the child with its immediate parent
- Report on Children: Adds the immediate children of the an assembly or sub-assembly.

Customer value

- Users browse structure top-down, bottom-up, or by particular branches
HD3D Visual Reporting
NX 7.5 – Save and Organize in Teamcenter

Capabilities in NX 7.5
- Save new or modified reports into Teamcenter folders
- Organize reports in Teamcenter
- Browse Teamcenter folders for report on Open.
- Access recently used reports

Customer value
- Customers manage and distribute visual reports to design teams across the enterprise
HD3D Visual Reporting Summary

**Comprehend the big picture with 3D presentation of PLM data**

Visual analytics in the context of 3D designs, providing the right information for making the right decisions.

**Immediate access to details using on screen navigation & interactive tagging**

**Bring decision support tools to the development environment**

Several components in the "Climate Control" have "Not In Process" Status.
Demonstration

HD3D
Over 80% of a designer's time in a CAD system is spent editing and creating geometry

You need to be able to design using modeling tools that deliver:

- Efficient design creation
- Fast design modification
- The ability to maximize data re-use
Increasing Design Efficiency

The Value of NX Synchronous Technology

Rapid Design Creation
- No need to pre-plan designs for future edits
- Rapidly create and evolve your design
- Advanced Data Reuse Capabilities

Rapid Design Modification
- No need to interrogate designs to understand how to make a change
- Always predictable results
- Ideally suited for Multi-CAD

The Best of Both Worlds
- The power of history-based modeling with the speed and flexibility of Synchronous Technology

The efficiency savings of NX with ST benefits every single user. Simply deploying ST can enable companies to meet cost cutting targets.

Design Overview

- **Improved modeling workflow** – 1 Pick Positioning, Direct Sketching, Inferred Boolean and Auto Complete streamlines the most common design workflow
- **Sketching tools** such as auto dimension, patterning and cut/copy/paste enhancements simplifies section definition and maximizes reuse
- **2D Section Library** – enables sketch geometry (both out of the box and user generate) to be easily reused throughout NX
- **Offset Surface** with partial results simplifies the process of creating the final solid model
- **3 Face Blend** enables full radius blends for design features such as ribs and seals
NX 7.5 delivers a collection of capabilities that work together to deliver

**Dramatic improvements to core modeling workflows**
Demonstration

Design Efficiency
Teamcenter Inside NX

In NX access to Teamcenter for item browsing, searching, selection and creation

Live status information & check in/out from session navigators

Live PLM access for product configuration, check-in/out, where-used, where-referenced, etc

Performance & scalability for 2/4 tier deployments over LAN & WAN

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Active Mockup

Understand the big picture while performing design tasks in context

- **Large Assemblies**
  - Work with many components in complex structures

- **Multi-CAD**
  - Work in the context of parts from multiple CAD systems

- **Interpart Modeling**
  - Quickly and easily create and maintain links between parts

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**Active Mockup Overview**

- **Simple Lightweight Loading** makes working with lightweight data easier and more mainstream
  - Apply assembly constraints to lightweight data
  - Automatic loading of exact data when required
- Display remaining degrees of freedom from assembly constraints
- Efficient process for managing component display & adhering to company standards
- On-the-fly interpart linking for point, vector, plane & CSYS constructors
- Maintain associativity to Multi-CAD JT references
- Streamlined mirror assembly creation

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**NX Active Mockup Performance**

- **Load & Session Performance**
  - Solid not loaded to create associative constraint
  - Solid not loaded to create measurement annotation
  - Switch to solid
  - Solid not loaded in NX 5
  - Non-Associative
  - Associative

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Knowledge Reuse and Validation

Reuse is a central strategy for shortening design cycles and achieving higher cost savings

- Efficient re-use of NX models & design aides in the design process
- Development employs uniform practices throughout the company
- Eliminates need for specialized expertise to capture knowledge

Knowledge Re-use Overview
- Reuse Library expands to a common NX design platform
- New support for a wider variety of Reusable Data Types that installs with content ready for use Out-of-the-Box
- Classify a Part into Teamcenter Classification from Inside NX
- New Component First Mounting provides automation for inserting components and mounting features
- PTS Master Model Extensions enable PTS templates to more elegantly handle associated non-master data like drawings, FEA and motion analysis models
- PTS Visual Rules enable rule-based template configuration logic to be created using interactive graphical tools rather than typing code

PTS Master Model Extensions
Capabilities
- Product Templates can more elegantly handle associated non-master data like drawings, FEA and motion analysis models.

Customer value
- Templates pre-packaged with CAE and Drafting data eliminate a lot of repetitive building of analyses and drawings.
- Consistency and reliability increases as the potential for manual error is reduced.

Validation
- Event-driven automatic validation checking
- Teamcenter management of validation results protects parts at release
- Real-time validation of NX models against external requirements
- Library of OOTB Checks
- Day One productivity with ~300 checks OOTB in NX 7.5 Check-Mate

Embedded Validation and Documentation of Template Contents
Drafting & PMI

Automation
High degree of Automation with drawing templates, parts lists generation, section & detail views

Standards Compliance
Full set of tools for creating Standard Compliant drawings

Performance
High performance with best in class support for large, complex assembly drawings

Drafting Overview
- Track Drawing Changes helps eliminate manufacturing errors, and reduce drawing checking time
- Bidirectional Associativity allows you to drive 3D models directly from a 2D drawing!
- Dimension and Annotation enhancements
  - New Surface Finish command
  - New Compound Weld Symbol
  - Support for Limits & Fits
  - Define Dimension Axis
  - Control the size of the boundary around text islands
- New 2D design solution … DraftingPlus
- Improved support for Drafting Standards with additional coverage to a wider variety of drafting objects

PMI Overview
- Improved productivity for large, complex designs with PMI Lightweight Section View and PMI Search
- New ways of creating and utilizing PMI including leveraging PMI from JT in NX
- Simplified PMI authoring process by converting feature dimensions to PMI
- Annotation enhancements
  - Target Point symbols and FCFs
  - Improved PMI Surface Finish
  - PMI Centerlines and Center Marks
- PMI Custom Symbols are now leveraged through the Reuse Library and offer many new capabilities
### Summary

**Synchronous Technology**
- Geometry optimization for imported and migrated data
- Synchronous Freeform

**New and greatly improved workflows**
- 3D design efficiency, and 2D product layout workflow
- DraftingPlus

**PLM Integration**
- Visual Analytics in the context of 3D product
- 4-Tier performance
- Lightweight assembly loading

**Knowledge reuse and validation**
- PTS with Visual Rules

**Greatly improved simulation & manufacturing**
Thank you!

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