NX Design & Simulation
Smarter decisions, better products.

What’s New

May 31st, 2012
Siemens PLM Connection Nordic 2012

Jan Larsson
EMEA Marketing Director,
NX Product Engineering Solutions
“When you’re searching for a state of the art of tool to assist with product development, there are very few places better to look than at NX...

...One of the best compliments I can give Siemens PLM Software is that when I work through the updates, I’m never left with the question of “why would a user want that?” It’s always clear.

Al Dean
Develop3D
“NX CAE potentially changes the game for simulation,” says Dr. Keith Meintjes, Practice Manager for Simulation and Analysis at CIMdata.

- **Highly productive** environment for multi-domain analysis
- Enabling **CAE to drive design**
- Even for companies that do not use NX as their CAD authoring tool
NX ... an integrated solution platform
Intelligently Integrated Information boosts productivity

Product Engineering

Concept layout & Styling

Drafting & Documentation

Simulation & analysis

Tooling & fixture design

CAM Programming

Detail Design

Inspection Programming

Manufacturing Engineering
NX … an integrated solution platform
Intelligently Integrated Information boosts productivity
Smarter Decisions, Better Products
Key NX investment areas

Intelligently Integrated Information
   Multi-disciplinary
   Integrated solutions for complete product engineering

Future-proof Architecture
   Open, Scalable
   High performance standards-based environment

HD User Experience
   Usability
   Smart interface with in-context access to PLM data
Integrated solutions for complete product engineering

- Product Design
- Simulation
- Documentation
Smarter Decisions, Better Products
Key NX investment areas

Intelligently Integrated Information
Future-proof Architecture
HD User Experience

Integrated solutions for complete product engineering

- Product Design
- Simulation
- Documentation

© Siemens AG 2012. All Rights Reserved.
Siemens PLM Software
Efficient design solutions that allow users to complete more design iterations to make better development decisions in reduced time

Delivering...

- The ability for our customers to develop new innovative products, in shorter time
- The ability for engineers to develop and validate new designs in context of overall product
- The ability to develop complex products in a modular and collaborative environment
- An increase in reuse and adaptation of existing proven solutions
NX - Powerful, yet simple and efficient to use

Flexibility to use best tool for task in a single design environment delivers maximum productivity

**Parametric feature based modeling**
- Sketch Based Workflows
- Feature Based

**Synchronous Technology**
- Fast design evolution
- Multi-CAD design

**Freeform modeling**
- Flexible approaches to generate complex shapes
Continued Investment in Feature Modeling

**NX 8 Feature Browser** delivered more efficient navigation and improved awareness of feature relations

- Better understanding of model behavior

**NX 8 Feature Patterns** tools allow intent can be built into a single pattern

- Easy to create, understand and modify repeatable geometry
Continued Investment in Feature Modeling

Coming later this year…

Increased flexibility in part creation and editing including:

- Open Profiles
- Keep/Remove Regions (union – trim)
- Emboss Body

reduce feature count and part creation time

New **Sheet Metal** capabilities allow creation and forming/unforming of complex sheetmetal components
Continued Investment in Synchronous Technology

NX 8.5 will be the 5th Release of NX containing Synchronous Technology

Increased levels of model editing flexibility allow more “what-if” design studies in a shorter time

Increased levels of reuse and adaptation of existing geometry reduces your design time

Increased levels of Multi-CAD collaboration

Applications extend beyond CAD

Simple… Fast… Flexible

Simple to use tools
Less steps
Less features
Less dependencies

Better designs in less time
Continued Investment in Synchronous Technology

*Coming later this year…*

Enhanced move and delete capabilities increase your ability to use synchronous technology to solve your design challenges.

Increased flexibility in model creation and repair reduces the time taken to make geometry modifications dramatically.

© Siemens AG 2012. All Rights Reserved.
Siemens PLM Software
Continued Investment in Freeform Modeling

NX 8 Enhanced “core” workflow functions to make NX freeform easier to understand

NX 8 delivered improved derived curve & surface quality develop the shapes you need quickly and easily without manual geometry clean up

NX 8 delivered a new advanced real-time shading and rendering environment True Studio Task
Continued Investment in Freeform Modeling  
Coming later this year…

Enhanced freeform creation capabilities increase productivity

- Enhanced X-Form to support automotive class-A surface creation
- Improved support for design of engineered shapes externally defined by point data by directly importing point data files into NX
- Automated curve, spline and surface fit capabilities enabling you to efficiently create and edit geometry to fit to scans/facets

Enhanced analysis functions improve form validation for better overall aesthetics
Modular Design Concept

In systems engineering, modular design — or "modularity in design" — is an approach that subdivides a system into smaller parts (modules) that can be independently created and then used in different systems to drive multiple functionalities. A modular system can be characterized by the following:

"(1) Functional partitioning into discrete scalable, reusable modules consisting of isolated, self-contained functional elements; (2) Rigorous use of well-defined modular interfaces, including object-oriented descriptions of module functionality; (3) Ease of change to achieve technology transparency and, to the extent possible, make use of industry standards for key interfaces."[1]
Flexible tools for collaborative design

Using a systems engineering approach allows collaborative team design for complex parts.

Complex designs can be broken into isolated, self-contained functional elements that evolve independently.

**NX 8 Part Modules** allow you to breakup a complex part into separate elements.

Allowing multiple designers to work in parallel on a single design speeds product development.
Smarter Decisions, Better Products
Key NX investment areas

Intelligently Integrated Information

Future-proof Architecture

HD User Experience

Integrated solutions for complete product engineering

• Product Design
• Simulation
• Documentation

© Siemens AG 2012. All Rights Reserved.
Siemens PLM Software
Engineering simulation solutions that drive product performance decisions across the complete product lifecycle

Delivering...

- Earlier evaluation of cross-discipline trade-offs
- Faster product engineering iterations
- Enterprise-wide visibility of simulation results and knowledge
- Increased confidence that products will meet functional requirements
Multi-discipline CAE within a Single Environment

- Advanced Meshing
- Linear Structures
- Thermal
- Flow
- Motion and Controls
- Assembly Management

- Multi-CAD Geometry Editing
- Nonlinear Structures
- Electronics Systems Cooling
- FE Correlation and Update
- Durability
- Knowledge Automation

- Multi-Solver Support
- Response Dynamics
- Space Systems Thermal
- Laminate Composites
- Optimization
- Integrated Data Management

- Nastran
- Ansys
- Abaqus
- LS-Dyna
- RecurDyn
- Adams

© Siemens AG 2012. All Rights Reserved.
Siemens PLM Software
Integrated modeling and simulation
- Enable rapid design-analysis iterations necessary for simulation-driven product development

Multi-discipline simulation and optimization
- Extend physics domains and coupling to solve the toughest problems

System-level simulation
- Accelerate performance of large-scale models and assemblies

Simulation data/process management
- Automate best-practice capture and re-use and seamless management of simulation data
Continued investments in simulation modeling

NX 8 Surface wrap fluid domain allows users to quickly create meshable fluid domain geometry – from hours to seconds
- “Wraps” interior of complex assemblies
- Greatly simplifies fluid domain creation
- Associativity to design is unique to NX
Continued investments in simulation solutions

NX 8 **Topology optimization** creates an optimized shape based on FE model of design space, loads and constraints

- Good to use at conceptual stage of design or to reduce part weight
- Start design with an optimized concept from CAE and meet design objectives faster
- Develop lighter, yet stronger components
Continued investments in simulation management

Tight integration between NX CAE and Teamcenter for **FE Assembly Management** allows CAE assemblies authored in Teamcenter to be directly opened in NX

- When CAD is modified, CAE model reflects the change
- Faster model build process for complex assemblies
- CAE model reflects latest design content
Smarter Decisions, Better Products
Key NX investment areas

Intelligently Integrated Information
Future-proof Architecture
HD User Experience

Integrated solutions for complete product engineering

• Product Design
• Simulation
• Documentation
Standards compliant approaches to ensure engineering intent is communicated unambiguously across the organization

Enabling...

- Companies to streamline the process of documenting their 3D designs
- Companies to adopt model based definition (MBD) methods based around 3D annotation to share intent
Continued Investment in Drafting

NX 8 delivered significant Drafting User Interface Improvements

- Improved usability with Simplified Menus and Toolbars
- Smarter, faster new drawing creation
- Enhanced view creation & layout including New View Break (Broken View)

Increased use of templates

- New approach to definition and reuse of drawing borders including new “Sheet Zones” and “Title Block” capabilities

Improved Annotation Capabilities

- Additional support for country drafting standards
Continued Investment in Drafting
Coming later this year…

New **Lightweight View** architecture for drawing views

- Improved performance and memory optimization for drawing creation and update

Support for several drafting operations on the lightweight representation including common view functionality, annotation, dimensioning

- Lightweight drawings use between 2 to 3x less memory
- Drawing views generated 4 to 11x faster
**Continued Investment in PMI**

(*Product and Manufacturing Information*)

Major focus on enhanced usability & product quality

PMI Verification ensures GD&T on a part is compliant with standards (ISO and ASME)

Enhanced PMI Lightweight Section Views allowing easier visualization of 3D data

Simplified Inherit PMI on drawings with improved support for PMI Lightweight Section Views
Smarter Decisions, Better Products

Key NX investment areas

Intelligently Integrated Information

Future-proof Architecture

HD User Experience

High performance standards-based environment

• Managed

• Scalable

• Openness Multi-CAD & Multi-Solver
Future-proof Architecture

Protecting your investment in technology and intellectual property

- Confidence that product data will move forward between releases
- Flexibility to use the tools you want to deliver your products
- Collaborative design-in-context in an extended environment
- Increased levels of data reuse throughout the entire design process
Continued focus on data “version-up” ensuring NX forward compatibility

SOA architecture for worldwide concurrent design delivering high performance 3D data with live BOM access

Highly scalable product design environment enabling development of “Massive” products

JT based Multi-CAD enabling partners and supplier data integration regardless of originating design solution
The Challenge of Developing Massive Products

Data Management & Integration

**Enterprise**
- Massive product definitions / designs
  - Millions of business objects
  - Independent lifecycle for business objects
  - Multiple hierarchical views of business objects

**Collaborative Design**
- High level requirements & concepts driving distributed detail design process
- Design data integrated with business processes – EBOM/MBOM – BOM Driven DMU

**Work Concurrently**
- Data organization, access control & locking for concurrent team working
- Notification of change and user control of accepting changes

**User Productivity**
- Work in context of live product (vehicle) data
  - Subsets of data for productivity & scalability
  - Live search for latest data

© Siemens AG 2012. All Rights Reserved.
Siemens PLM Software
NX Support for Multi-CAD

JT, NX and ISO

JT is an ISO Publicly Available Specification (PAS)

Continued emphasis on using JT data inside of NX as multi-CAD data backbone to enable global supplier collaboration

NX and JT multi-CAD data sets are supported

Associative relationships including positioning constraints between NX and JT persist across changes to JT
Continued Investment in Multi-Solver Simulation

Tailored environment for each solver

Unique architecture supports custom environment for each solver

Solver-specific data directly stored in NX – no translation required

Simplifies user experience

3rd party FEA Solvers

MSC Nastran™ ANSYS® Abaqus LS-Dyna®
Intelligently Integrated Information

Future-proof Architecture

HD User Experience

Smart interface with in-context access to PLM data

• NX Usability
• HD3D Visual Reporting
• Check-Mate
• Issue Management
Simple, efficient tools for Product Engineering

- Engineers require simple and efficient development tools ... intuitive, consistent, effortless
- Engineers need to access information quickly to support their decision making
- Engineers must be able to collaborate freely and quickly
Continued focus on user experience and clarity of purpose

- Enhanced use of see-thru to allow user to focus on results of actions in blending

- Customizable context dialogs reduce mouse travel and bring common commands to point of use
HD3D
Simplifying the understanding of PLM information

Visual analytics in the context of 3D product design

Google Earth style interaction

Information drill-down
- Visual Reporting
- Design Validation
- Requirements Validation
- Issues Management

Design review....
How much of the product is still WIP?
Ad hoc user inquiries....
Who is working on this assembly?

Context setting....
Show all structural components
HD3D for Simulation

Simulation results linked to HD3D tools

- Requirements Validation, CheckMate, Visual Reporting
- Leveraged by Product Template Studio and NX Modeling Optimization
Smarter Decisions, Better Products

Summary - NX delivering on the vision

Intelligently Integrated Information
- Multi-disciplinary
  Integrated solutions for complete product engineering

Future-proof Architecture
- Open, Scalable
  High performance standards-based environment

HD User Experience
- Usability
  Smart interface with in-context access to PLM data
Smarter Decisions, Better Products
Summary - NX delivering on the vision

- Intelligently Integrated Information
  - Maximizes reuse of your investment in your data by delivering a seamless environment for Product Engineering

- Future-proof Architecture
  - Our investment in NX and Teamcenter protect your investment in technology and intellectual capital

- HD User Experience
  - Continued focus on delivering a High Definition User Experience improves product engineering productivity, allowing more design iterations and easy access to PLM data

The efficiency savings delivered with NX Product Engineering solutions benefit every user…

…more design iterations, smarter decisions, better products
NX Design & Simulation
Smarter decisions, better products.

THANK YOU

Jan Larsson
EMEA Marketing Director,
NX Product Engineering Solutions