



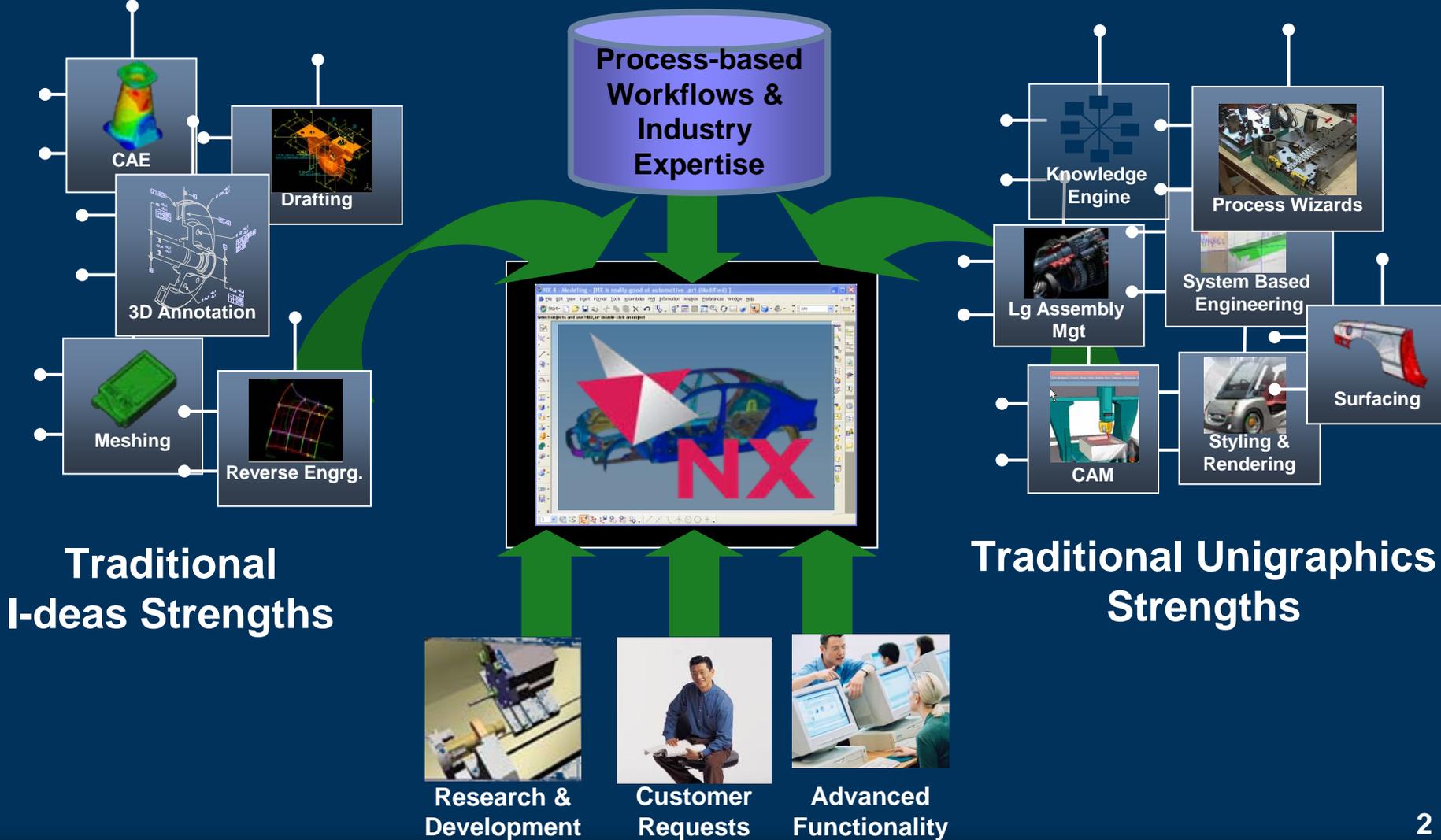
I-deas to NX Migration Overview and Update

Bob Haubrock — Director I-deas, I-deas / NX Migration, NX Drafting, India Development

Robert.Haubrock@ugs.com



Superset Functionality to Improve Customer Workflows





I-deas to NX Migration – Objective



- ▶ To migrate customer data from the I-deas environment into the NX environment
 - ▶ Preserving customer investment and intellectual capital held within the data
 - ▶ Maintaining continuity in the workflows and processes



I-deas to NX Migration – Strategy



- ▶ Customer migration through a series of controlled data migration phases to ensure integrity and stability of the data throughout the process
 - ▶ Data analysis
 - ▶ Analyse the data to determine when to migrate
 - ▶ Data management migration
 - ▶ Migrate the I-deas data into Teamcenter
 - ▶ Content migration
 - ▶ Migrate the I-deas data to NX data within the context of Teamcenter
- ▶ All phases of the migration are to be supported by tools and services provided by UGS PLM Solutions and certified partners



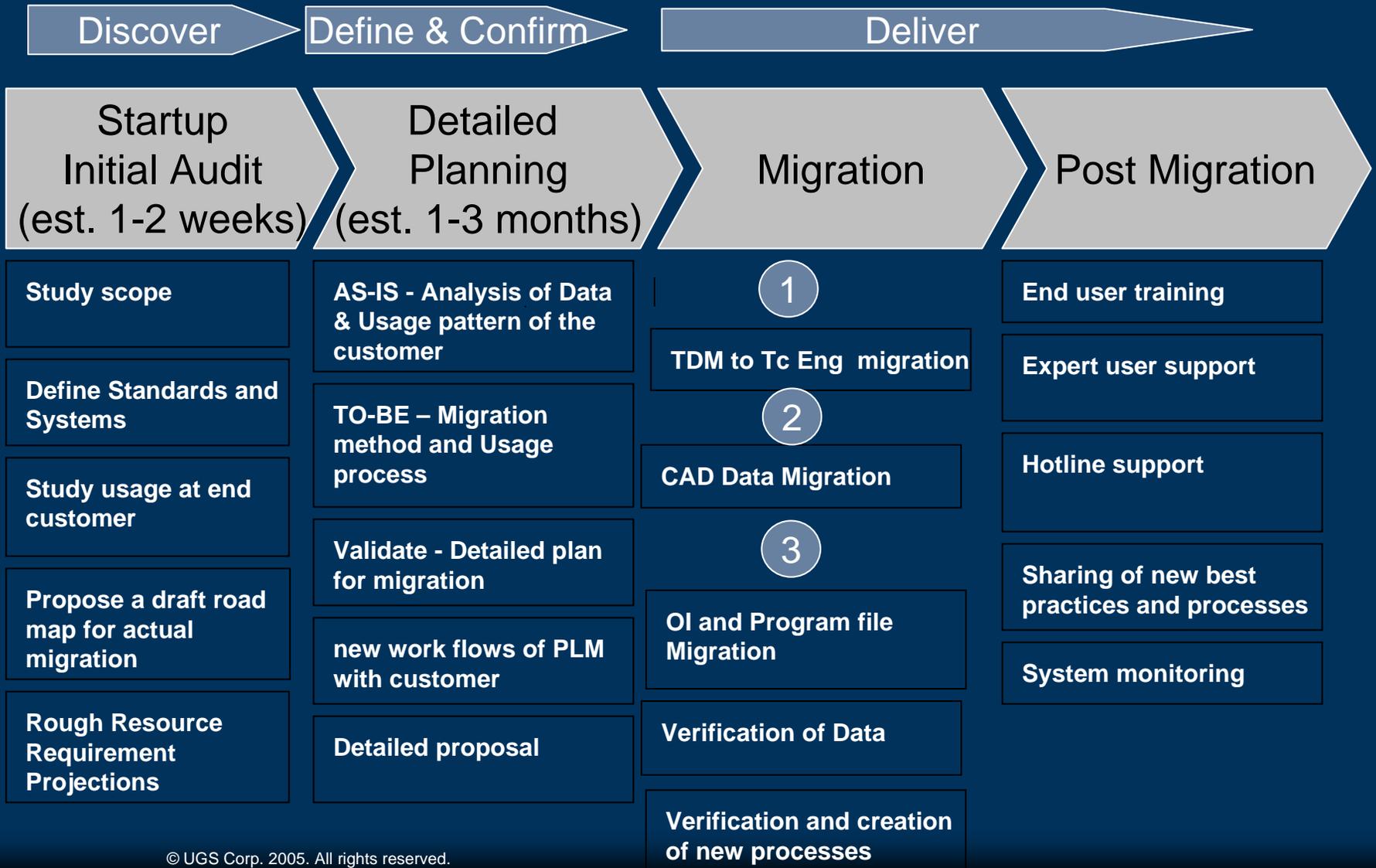
New projects on NX and Teamcenter



- ▶ Some customers, choose to start new projects or new users on NX using Teamcenter
- ▶ This happens in the case of no need for data migration from I-deas or limited interaction with groups/users or data that is still working in I-deas
- ▶ This is supported with standard UGS infrastructure and programs



Migration Process Overview

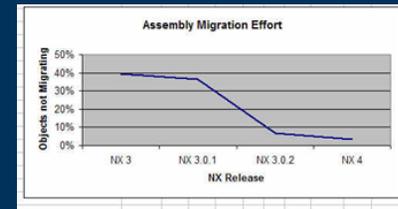




Evolution of Excellence – Migration Audits



- ▶ One – Two Day on-site engagement with customer
- ▶ Performed at over 200 customers world-wide
- ▶ Analyze all TDM metadata for migration to Teamcenter
- ▶ Analyze all Parts, Drawings and Assemblies for features / entities / instances and give estimated migration success rates for NX 3 and NX 4
- ▶ Analyze all Customizations (Open I-deas and Program files)
- ▶ Give Migration Overview Presentation
- ▶ Demo Migration tools with customers data using Teamcenter Engineering and NX 4



Summary for an I-deas to NX Migration

Prepared for

MAN Roland

Submitted by

**Bob Haubrock
Paul McDonald**



Date
December 9, 2004

We under went our "early adopter" I-deas to NX initial audit by UGS in August 2004. UGS came out to our company and spent two days with us, analyzing our CAD data and showing us the new products. My overall anxiety has pretty much disappeared now that I have seen the products as they relate to our CAD data. The products - both CAD NX and TDM to Teamcenter Engineering NX Manager I-deas look solid."

*Susan Despotopulous
PLM World Technical Track Chair
Micro Motion Corporation*



Driving Factors for Change

Early 2003



- Server & Desktop
- Multiple Interfaces

Today



- Significantly Increased Product Offering
 - ✘ Ability to leverage existing designs
 - ✘ Improved communication and knowledge capture between teams
- New Markets
- Increased Collaboration between Design Centers
 - ✘ More robust data sharing
- Deeper Engagement with Suppliers
 - ✘ Third party data
 - ✘ Improved access model

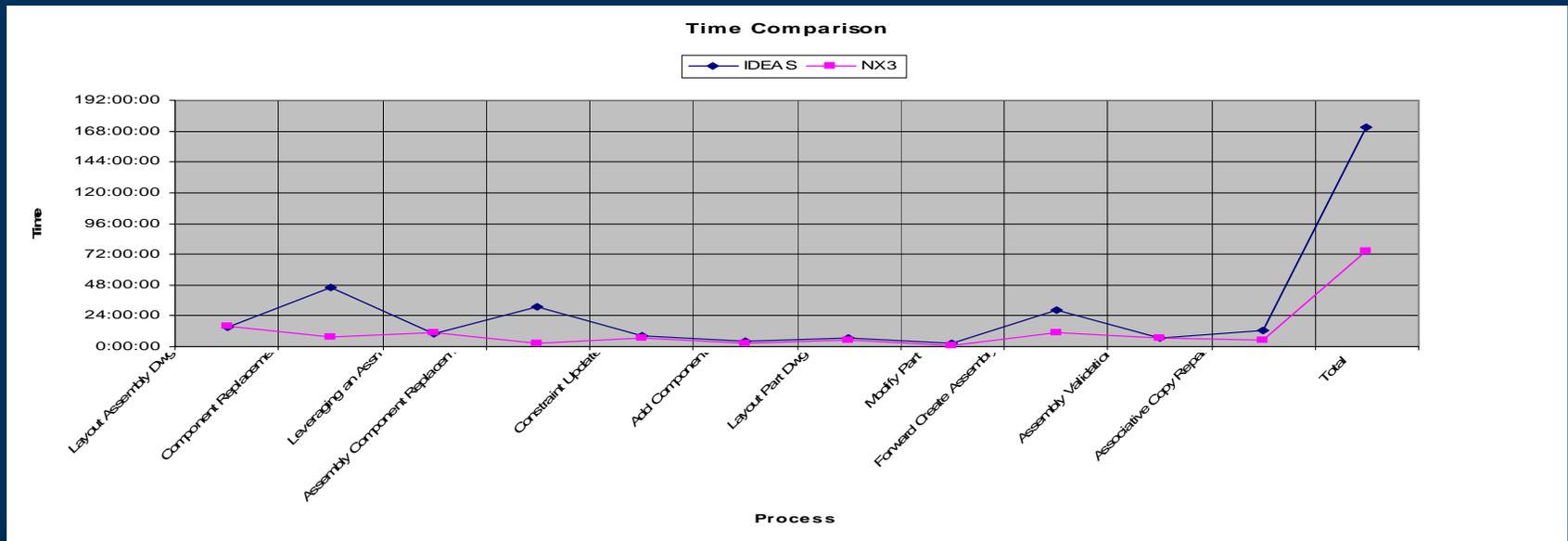
I-DEAS to NX: One Company's Journey
5/3/05



Document Value of Moving to NX over I-deas



- ▶ CAD workflow studies
 - ▶ Usually no more the 4 hours long each
 - ▶ Most companies define 3-5 workflows each (so not everything)
 - ▶ Existing I-deas workflows are documented and new NX workflows are developed and documented
 - ▶ Productivity measures are given for each workflow (time, clicks, mouse movement...)
 - ▶ Used as basis for documenting productivity advantages of future upgrades to NX after this baseline is created





Building a Business Case

Business Drivers

Why?

Technology Renewal

- I-DEAS is at end of life.

Cost Avoidance

Vendors are selling competing products to dissatisfied us

- currently >Z1 non-Standard licenses at Seagate (~ \$XXX K)
- Extremely high cost to re-integrate unmanaged deployments

Why Now?

NX Productivity

- CAD Productivity
- Common Parts
- Ease of use

Inter-site Data Sharing

- Eliminate manual transfers
- Improved quality through collaboration

Enterprise Processes

- Supplier Collaboration
- Purchasing
- Program Management
- ...

Quantified

Unquantified

- Labor Baseline

Y1 FTE ~ \$X1 M /yr

- CAD Workflow Benefit

\$X2 M/yr → Y2 FTE

- DMLink Transfer Eliminations

\$X3 M/yr → Y3 FTE

- Identified Process Improvements

\$X4 M/yr

* Not used in FTE calculations

- Commercial Parts

- Reduced Training

- Quality Impact due to lack of sharing

- Duplicate Parts

- Unmanaged Supplier Interchange

- Obsolete inventory

- PDM Integration (Quality Impact)



Teamcenter – First step of Migration

remove TDM



- ▶ Teamcenter Engineering
 - ▶ Preferred solution for integration with NX with manufacturing features
- ▶ MI Admin – Tool used to clean/correct data in TDM and multiple TDM's prior to migration to Teamcenter
 - ▶ Latest enhancements support modifications useful for migration to Teamcenter Engineering and fixing I-deas 8 Drawing migration data

	A	B	C	D	E	F	G	H	I	J	K
1	#USERNAME = jsmith										
2	#DATE = Fri May 16 10:43:02 2003										
3	#										
		Error Group			Item Type	Version					
4	#Error Type	Number	Item Name	Part Number	Name	Number	Rev	New Value	Action	Project Name	Installation Master ID
5	ITEM_NAME_TOO_LONG	89	Teradyne (LC 8x10 w/guide on right)		LIB PART	1		Teradyne (LC 8x10)		Standard	7
6	ITEM_NAME_TOO_LONG	89	Teradyne (LC 8x10 w/guide on right)		LIB PART	1		Teradyne (LC 8x10)		Standard	6
7	INVALID_IMPORT_EXPORT_LOC	121	10-0057-01	10-0057-01	LIB PART	1			IE_LOCK_OFF	Standard	7
8	INVALID_IMPORT_EXPORT_LOC	121	10-0057-01	10-0057-01	LIB PART	1			IE_LOCK_ON	Standard	6
9	MULTIPLE_PART_NUMBERS	129	62-8791-01	REFDWG_OC192	LIB DRAFTING	8	A0			OIBU.GSR	6
10	MULTIPLE_PART_NUMBERS	129	62-8791-01	REFDWG_OC192	LIB DRAFTING	9				OIBU.GSR	6
11	MULTIPLE_PART_NUMBERS	129	62-M192C-01	REFDWG_MERLIN	LIB DRAWING	10		REFDWG_OC192	PROPAGATE	OIBU.GSR	6
12	MULTIPLE_MIGRATED_DRAWIN	504	33-1729-01		LIB ASC DRAW	3				mattmohr	6
13	MULTIPLE_MIGRATED_DRAWIN	504	33-1729-01		LIB DRAWING	4				mattmohr	6
14	BAD_MIGRATED_DRAWING_RE	646	28-MERLIN192C	PCBFAB_MERLIN1	LIB DRAWING	3	02		FIX_RELATION	OIBU.GSR	6
15	BAD_MIGRATED_DRAWING_RE	678	62-9234-01	ASY_YB_AC_GEF	LIB DRAWING	2	02		FIX_RELATION	OIBU.GSR	6
16	DUPLICATE_PART_NUMBER	715	29-0985-01	29-0985-01	LIB PART	3				Standard	7
17	DUPLICATE_PART_NUMBER	715	old part	29-0985-01	LIB PART	3		old part	PROPAGATE	Standard	7



Sample Customer TDM Analysis



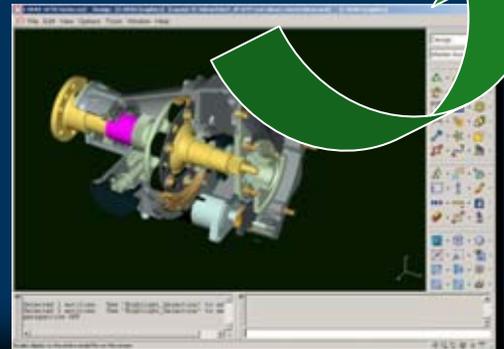
- ▶ 92 Duplicate version numbers
- ▶ 10 missing item names
- ▶ 805 multiple item names
- ▶ 4086 missing part numbers
- ▶ 1117 multiple part numbers
- ▶ 912 invalid import export lock status
- ▶ 113 migrated drawing duplicate version numbers
- ▶ 200 invalid copy of migrated drawings
- ▶ 29 multiple migrated drawings
- ▶ 21580 duplicate part numbers
- ▶ 80 Bad migrated drawing relationships
- ▶ 29 invalid migrated drawing attributes
- ▶ 31701 duplicate item name
- ▶ 16 invalid characters in item name
- ▶ 12246 item names too long
- ▶ 164 part names too long



Second Step – Data Migration Begins with NX 3



- ▶ **Increased Functional Breadth and Depth by Leveraging Two Existing Highly Productive Products**
 - ▶ Knowledge Driven, Open, Standards Based
- ▶ **Key I-deas Functionality being Added to NX**
 - ▶ Assembly Configurations, Drawings Containing Multiple Parts, Variational Sweep
- ▶ **Benefit from Existing Unigraphics NX Strengths**
 - ▶ Parasolids, Part Navigator, Form Features
- ▶ **Combined R&D Engine Drives Further New Enhancements**
- ▶ **Revolutionary Tools to Preserve Data**
 - ▶ Part Features, Associated Drawings, Assembly Constraints, Content Migration
- ▶ **Customization Mapped to Next Generation NX Functionality**
- ▶ **End User Training, Help and Intuitive New User Interface**
- ▶ **Predictable Migration Process**
 - ▶ Audit tools, Service Standards, Certified Partners





Content Migration Manager (CMM)



Migration Modes

- ▶ Interactive UI
- ▶ Command line/bulk tools

Select data for migration

- ▶ User may select items, item/revisions or folders
- ▶ CMM resolves dependencies

Configure Migration

- ▶ User may configure the migration operation
- ▶ Style of migration (e.g., Brep vs features)
- ▶ Success criteria
- ▶ Level of checking

The screenshot displays the Content Migration Manager (CMM) interface within Teamcenter Engineering V8.1.1.2. The main window shows a file tree on the left with folders like Mailbox, Newstuff, and Satellite. An 'OptionsDialog' window is open, showing configuration controls for the Content Migration Manager, including 'Target units' set to Millimeters and 'Target data' set to Managed. A 'Migration Status' dialog is also open, displaying a table of migration items.

Name	Number	Type	State	Status	Completion Status
Ass_Satellite	000739	assembly	Checkout	Scheduled	78
Red_17	000728	part	Checkin	Current	100
Rondelle_esp_2	000733	assembly	Checkin	Current	50
Red_28	000722	part	Checkout	Scheduled	0
Red_11	000730	part	Checkin	Current	100
Entretoise	000734	assembly	Checkin	Current	50
Red_27	000723	part	Checkout	Scheduled	0
Tourillon	000736	assembly	Checkin	Current	100
Red_13	000724	part	Checkin	Current	100
Cages_aiguilles	000732	assembly	Checkin	Current	100
Red_34	000727	part	Checkin	Current	100
Plaque arret	000735	assembly	Checkin	Current	100
Red_87	000726	part	Checkin	Current	100
Red_25	000729	part	Checkin	Current	100
Ecrous_66	000737	assembly	Checkin	Current	100
Red_66	000725	part	Checkin	Current	100
Red_16	000731	part	Checkin	Current	100
Rondelle_esp	000738	assembly	Checkin	Current	50

Below the table, a log window shows migration progress and reuse information:

```

** Reusing migrated item000725 / A : Red_66 ; part
* 000725 / A : Red_66 ; part ugDataset current 100%
** Reusing migrated item000737 / A : Ecrous_66 ; assembly
* 000737 / A : Ecrous_66 ; assembly ugDataset current 100%
** Reusing migrated item000731 / A : Red_16 ; part
* 000731 / A : Red_16 ; part ugDataset current 100%
** Reusing migrated item000738 / A : Rondelle_esp ; assembly
* 000738 / A : Rondelle_esp ; assembly ugDataset current 100%
* 15 ugnx datasets be reused
* 3 ideas datasets will be migrated

```

Migration Reporting

- ▶ Pre-migration report
- ▶ In-migration status (dashboard)
- ▶ Post-migration summaries
- ▶ Item migration reports (persistent)



Part Migration Options



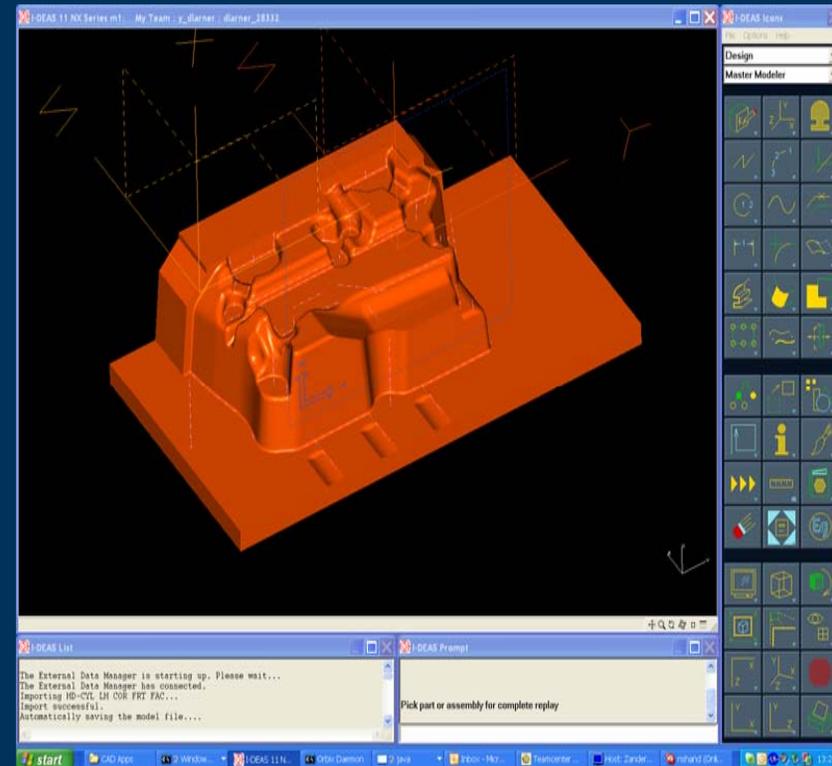
- ▶ JT file with precise data
 - ▶ Full support for design in context
 - ▶ Facet and precise measure, cross section and interference
 - ▶ Full support of PMI between JT parts and native geometry
- ▶ Boundary Representation
 - ▶ Direct Modeling Extensions (DMX) in NX will add support of modification of some geometry
 - ▶ I-deas Coincident Point Tolerance accuracy guaranteed
- ▶ Features
 - ▶ Full and partial featured models
 - ▶ I-deas Coincident Point Tolerance accuracy guaranteed
 - ▶ Partial featured models still have all parameters of all features stored with model
 - ▶ Aids in recreation of fully featured model
 - ▶ Aids in information to modify design intent for many modifications



Migration Part Test



- ▶ Automotive Migration Part
 - ▶ Front Core Cylinder Head
 - ▶ I-deas 10 M1 Part
 - ▶ Part Version 22
 - ▶ 191 Major and Minor History Steps
- ▶ Migration Results Released Code
 - ▶ NX 3.0.1 and I-deas 11 M2
 - ▶ 97% Feature Pass Rate
 - ▶ 6 Advanced Fillet Issues
 - ▶ Rollover and stop short
 - ▶ Manual repair to get same part as I-deas took 20 minutes
- ▶ Rebuilding all geometry from scratch in I-deas took 20 hours



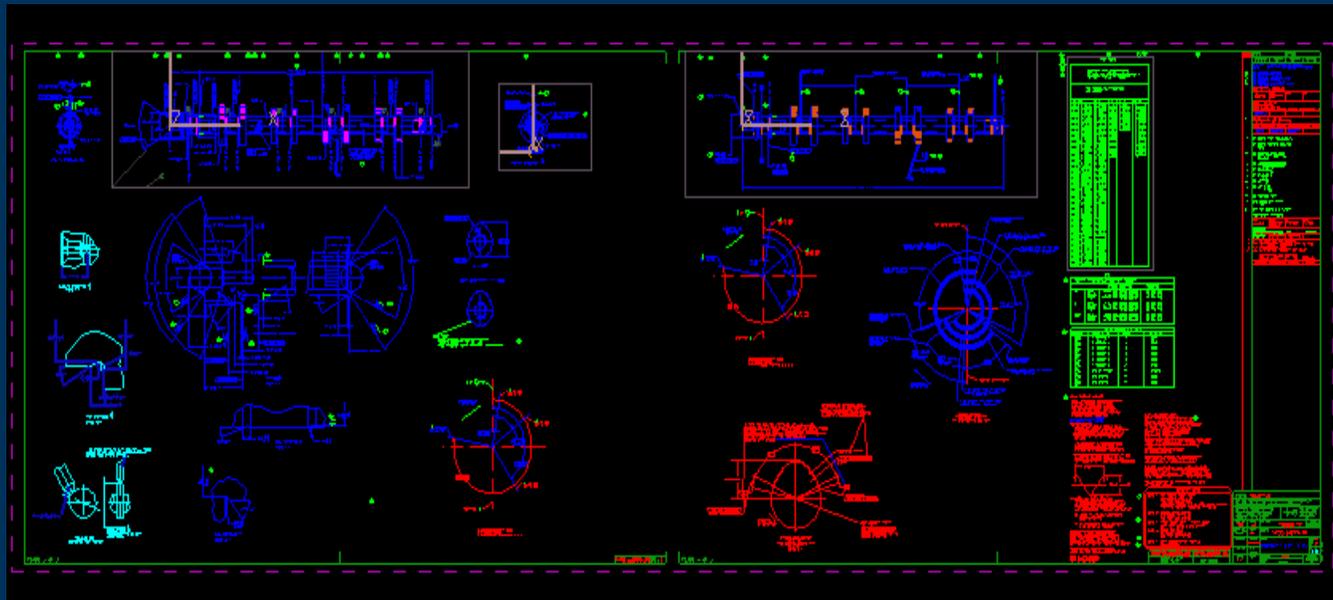
Part Migration Value 60 to 1



Drawing Migration Results



- ▶ Example of Drawing migration test at Canon
- ▶ Drawing migration certified for fidelity and associativity
- ▶ Migration pass rate for this set of drawings in NX 4.0.0 is 92% or 193,572 entities migrated successfully
- ▶ Most conservative estimate of value of migration of these drawing compared to going to any other CAD system is **75 to 1**





Fidelity Certification of All Migrated Data



Parts

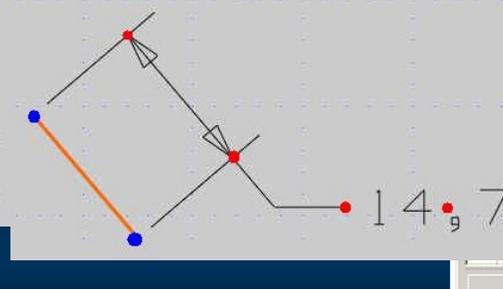
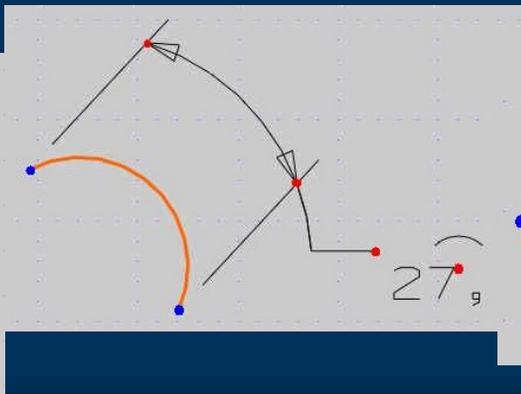
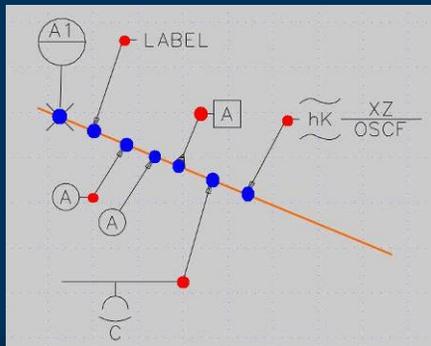
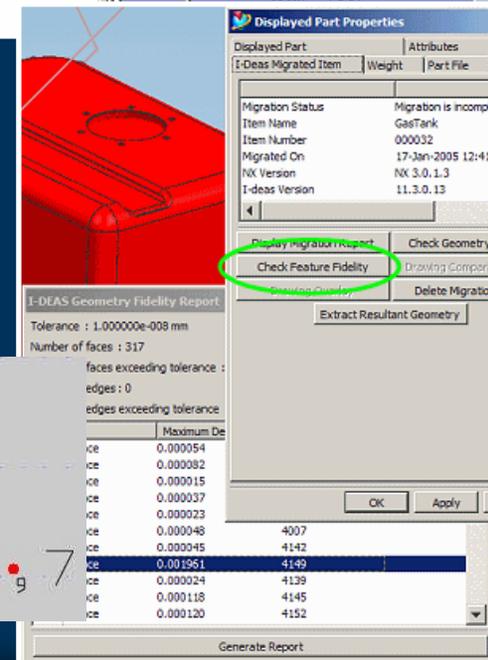
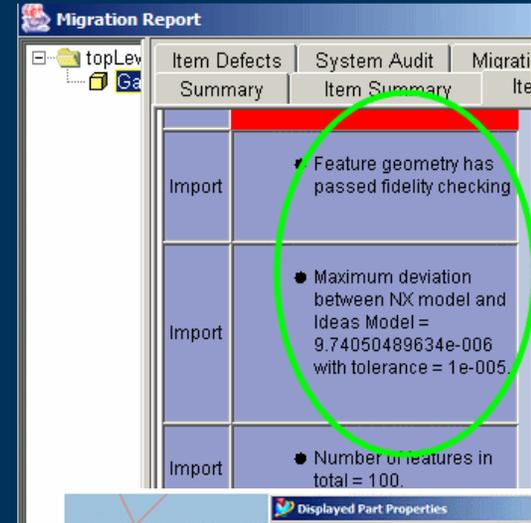
- Fidelity Measured at I-deas Coincident Point Tolerance (PCT) of $1e-5m$
 - “/up f” Developed Originally as Joint Project with Ford
- All Faces are Compared with the Original I-deas Faces

Drawings

- Pixel, vector and unique “key point” drawing entity certification tool
- All drawing entities are certified with associativity

Assemblies

- Location, configurations, constraints and ACF relations all certified

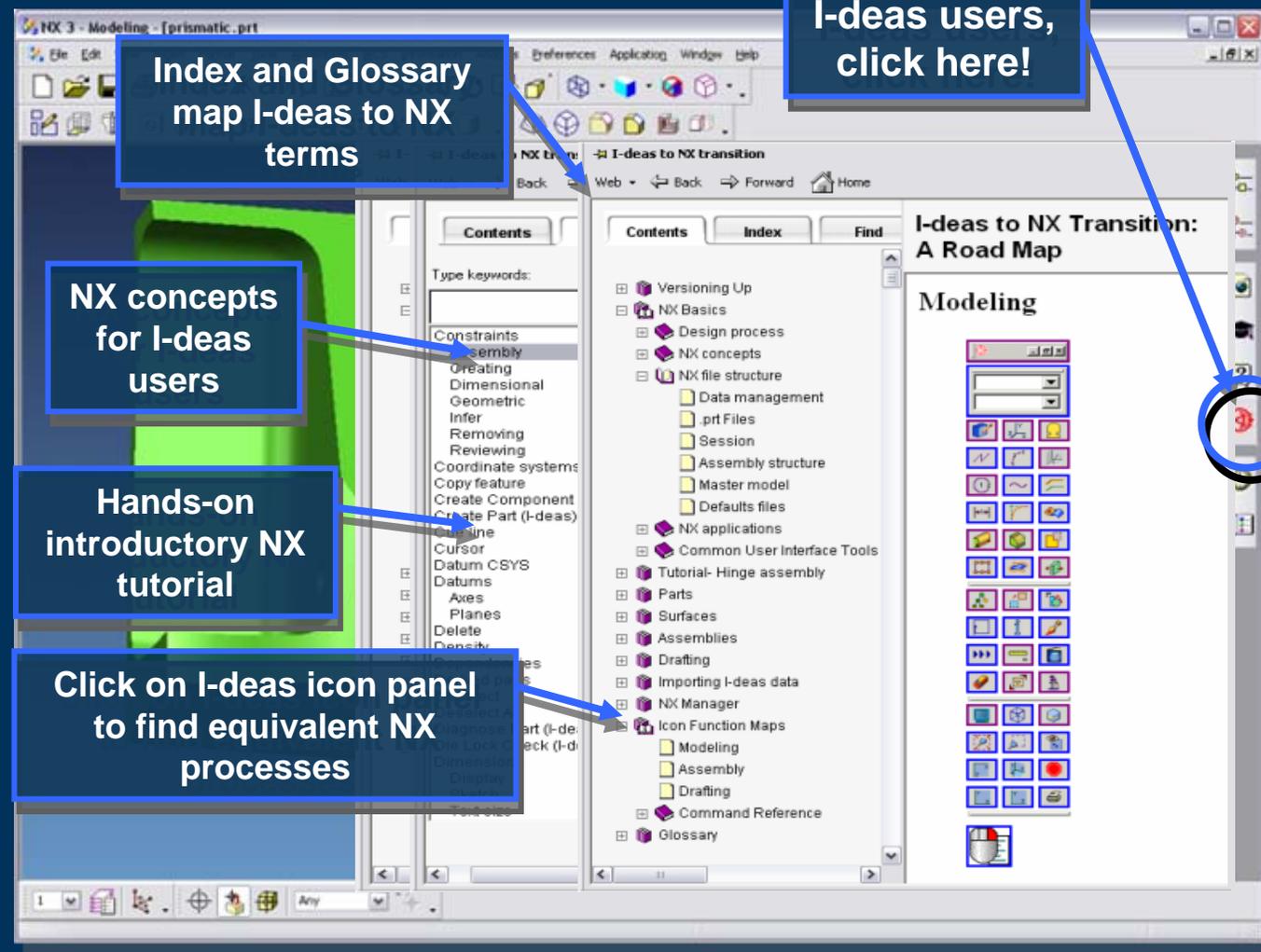




Making I-deas Users Productive in NX



- ▶ I-deas On-line Job Aid
- ▶ I-deas Context Sensitive Help
- ▶ I-deas Function Mapping to NX 4 Commands
- ▶ NX and Teamcenter training classes and tutorials specifically for I-deas users
- ▶ Ability to Customize for Site Specific Use
- ▶ 100's of next generation functions from I-deas





- ▶ Requirement
 - ▶ Provide a CAD data mgmt solution meeting or exceeding the process capabilities of I-deas TDM
 - ▶ Provide process, templates, products, and tools supporting I-deas to NX transition of customer data and processes
- ▶ Business Value
 - ▶ Teamcenter delivers a CAD Manager solution for management of CAD context plus extended functionality for Engineering process, Multi-CAD, and RDV
 - ▶ UGS delivers transition processes, patterns, templates, best practices, and tools to streamline the



Typical TDM Environment

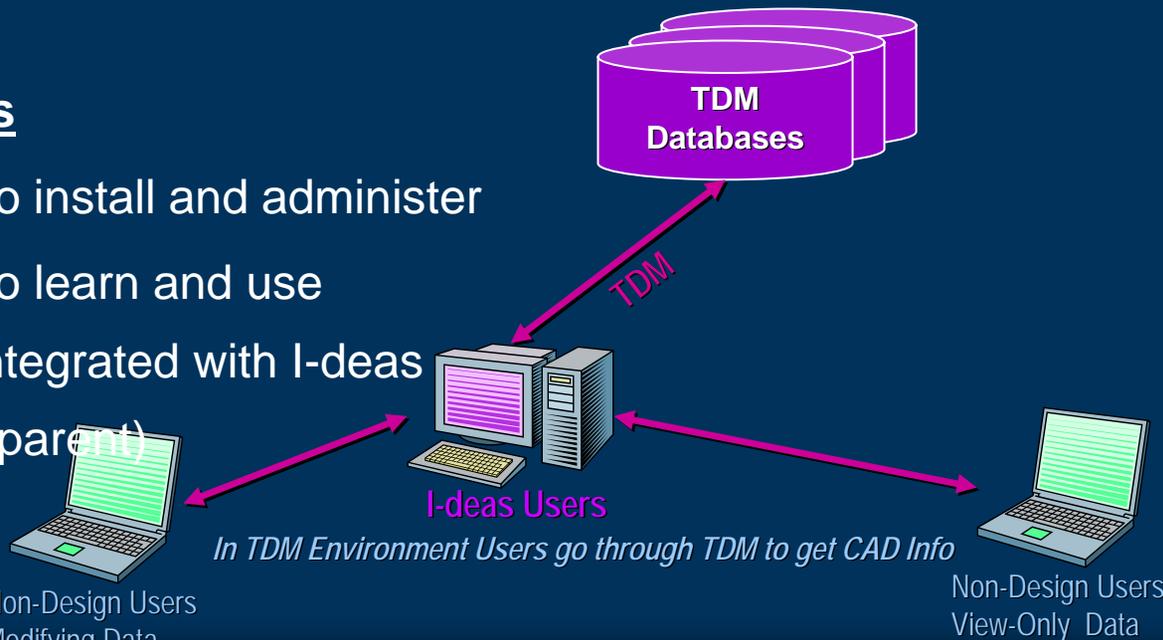


Capabilities

- ▶ Single site / team data management for I-deas
- ▶ Basic site-site transfers (package files)
- ▶ Entry level process capabilities:
 - ▶ Team member role assignments
 - ▶ Basic item states

Attributes

- ▶ Easy to install and administer
- ▶ Easy to learn and use
- ▶ Well integrated with I-deas
(transparent)

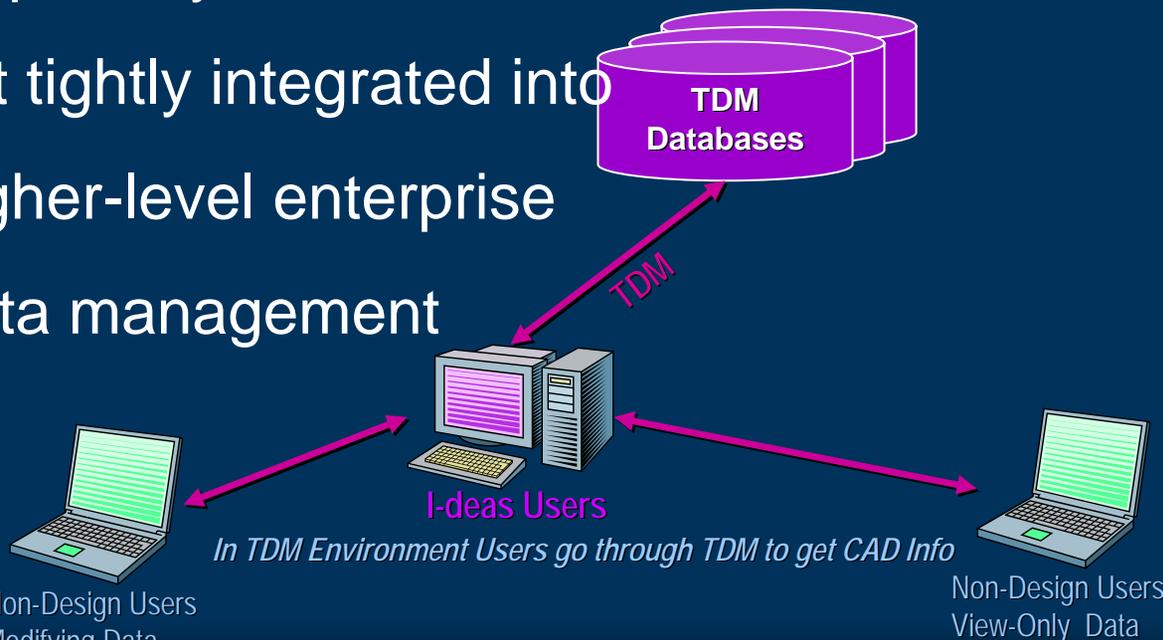




Typical TDM Environment



- ▶ Designed for I-deas data and users only
- ▶ Limited multi-site sharing
 - ▶ LAN based, not WAN or web based
- ▶ Practical limits on numbers of users
- ▶ Proprietary database
- ▶ Not tightly integrated into higher-level enterprise data management

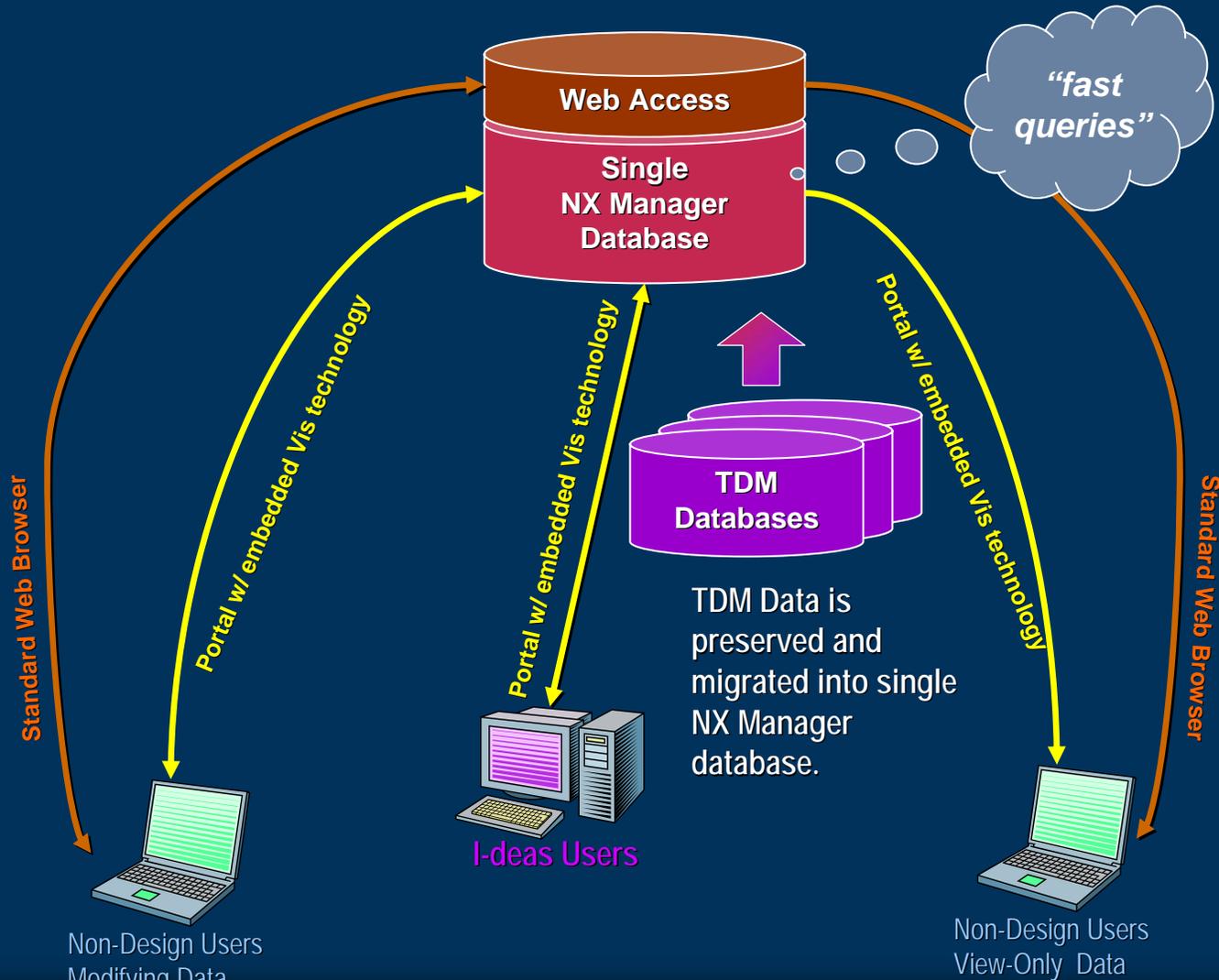




Upgrade TDM to NX Manager

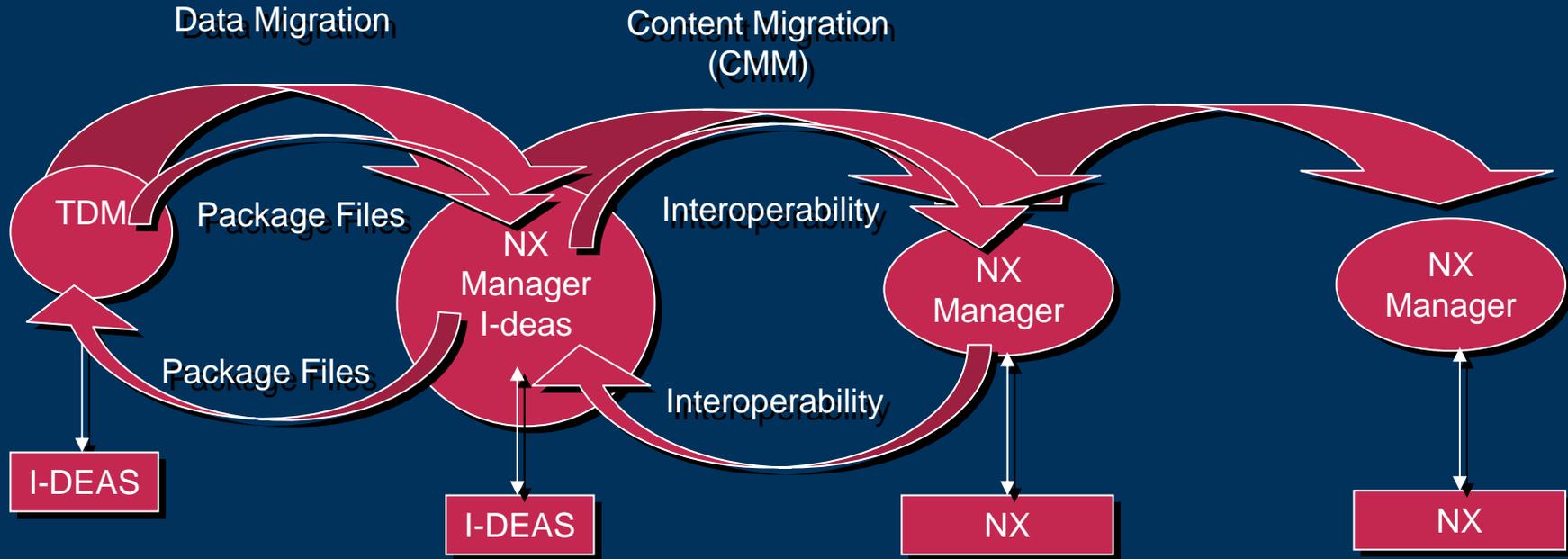


Users can use web interface to search, retrieve, and view CAD data



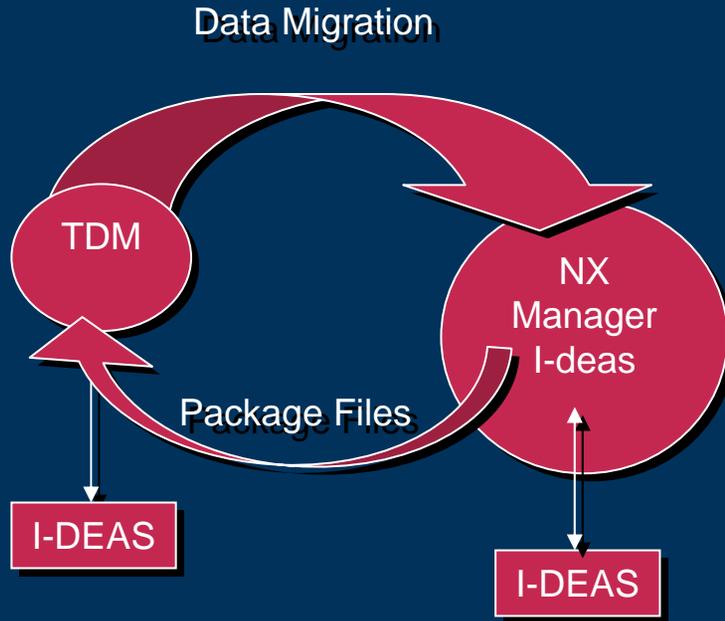


I-DEAS to NX





Migration Options



- ▶ Mass migration is not recommended for larger companies (>30 users)
- ▶ Step migration is supported but need strategy to minimize need for data to be sent back to TDM as it will be manual and use package files
- ▶ Second step migration from TDM to NX Manager is supported with the migration tools



Biggest Benefits of moving to NXMI for I-deas users on TDM



- ▶ Performance of check-in and check-out is much better for over 3 users
- ▶ Use of JT data for visualization in PDM as well as check out to I-deas
 - ▶ Many customers use JT data to check out 80% of the data they used to check out fully featured parts
- ▶ Full security, scalability of a PDM system
- ▶ Multi-site
- ▶ Path of data migration to NX

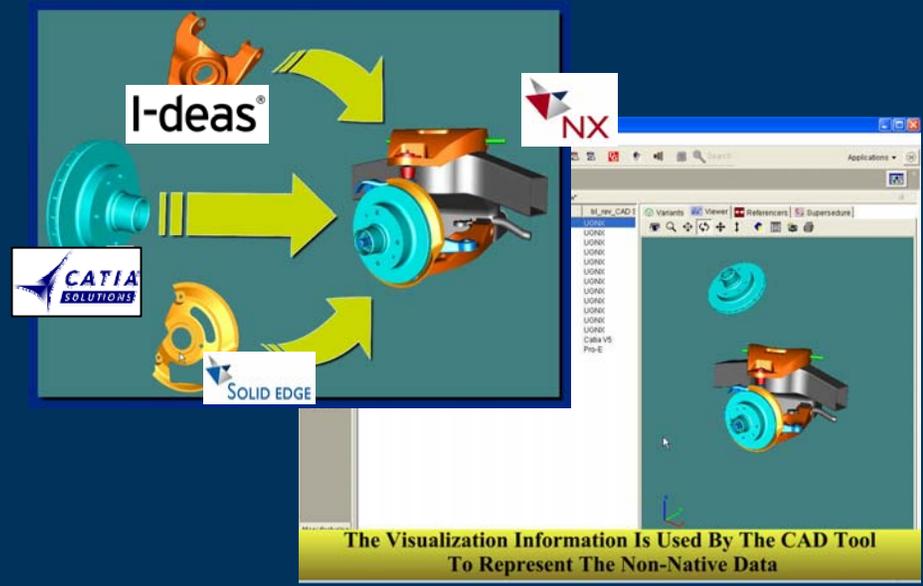


Design Management Multi-CAD Data Management



- ### Design Management
- ▶ Common platform/database for
 - ▶ Vaulting, check-in/out
 - ▶ CAD management
 - ▶ Multi-CAD vaulting
 - ▶ Multi-Site Collaboration
 - ▶ Visualization for consumers

- ### Engineering Process Management
- ▶ Common Engineering Processes for
 - ▶ Workflow and lifecycle management
 - ▶ Heterogeneous Multi-CAD Product Structure Management
 - ▶ Visualization for all and opportunity for Digital Mockup and Validation





NX Managed Development Environment

NX and Teamcenter are scalable and functionally rich



Managed Development Environment



- Simulation Management**
- Manage CAE data & processes
 - Simulation Process Studio

- Manufacturing Mgt**
- CAM Manager
 - Process Planning
 - Factory Management

- Design**
- Design Collaboration
 - Rich Design Configuration Management
 - Visual Change, Revision Rules, Alternates, Options and Variants...

- Multi-CAD Expansion**
- Integrated multi-CAD design environment
 - Cross CAD boundaries in both NX and Teamcenter

- Design Management**
- Vaulting
 - Check in/out

- User Defined Features
- Part Families
- Requirements
- Knowledge Fusion
- WAVE relationships
- Inter-part relationships
- PMI

- Machining**
- Spatial information to check for manufacturability and maintainability
 - Compositions, occurrence groups



Summary



- ▶ Robust migration from I-deas to NX native models
 - ▶ E.g. model history, sketches, reference geometry, associative drawings, assembly constraints, PMI, ...
 - ▶ Zero CAD license cost for Xerox and suppliers with I-deas
 - ▶ Data migration tools provided at no cost
 - ▶ Migration training offered by UGS
- ▶ Teamcenter Engineering offers a managed environment for work in process, managed migration process data
- ▶ NX offers best in class capabilities for product development
 - ▶ E.g. Design / visualization, CAD creation, Large Assemblies, harness design, Knowledge Based Engineering, Simulation

Moving to NX is Low Risk, Low Cost, High Value



www.ugs.com