

***Nidec***

All for dreams

***Global PLM  
Past, Present & Future***

**Nidec Motor Corporation**

# Agenda

- **Nidec overview**
  - Emerson Motor Company (Pre-Nidec)
  - Nidec Corporate
  - Nidec Motor Corporation (NMC)
- **NMC PLM timeline of events**
  - Initial driver for each major event
  - Complexity
  - Challenges tackled
  - Lessons learned
- **Observational summary**
- **Aras Innovator at NMC**
  - So far, so good
  - Future implementation possibilities
  - Integration vision

*“Complexity is not always a difficulty metric, sometimes it is merely descriptive of a solution’s problem space.”*

# Overview

- Established in 1890 in St. Louis, MO as foundation of Emerson Electric Manufacturing Company
  - 1892 built and distributed first electric fans in US
  - Followed quickly by electric sewing machines, electric dental drills, power tools, and appliance motors

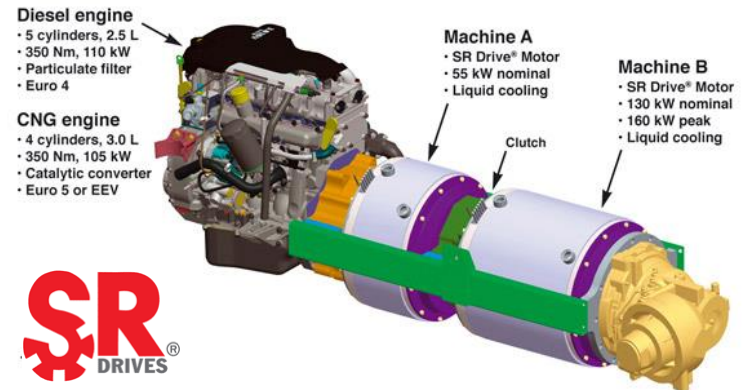
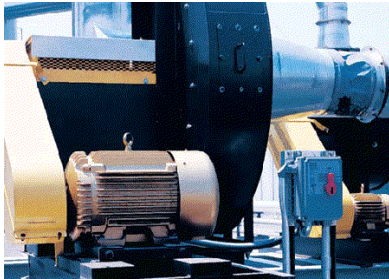


Circa 1898



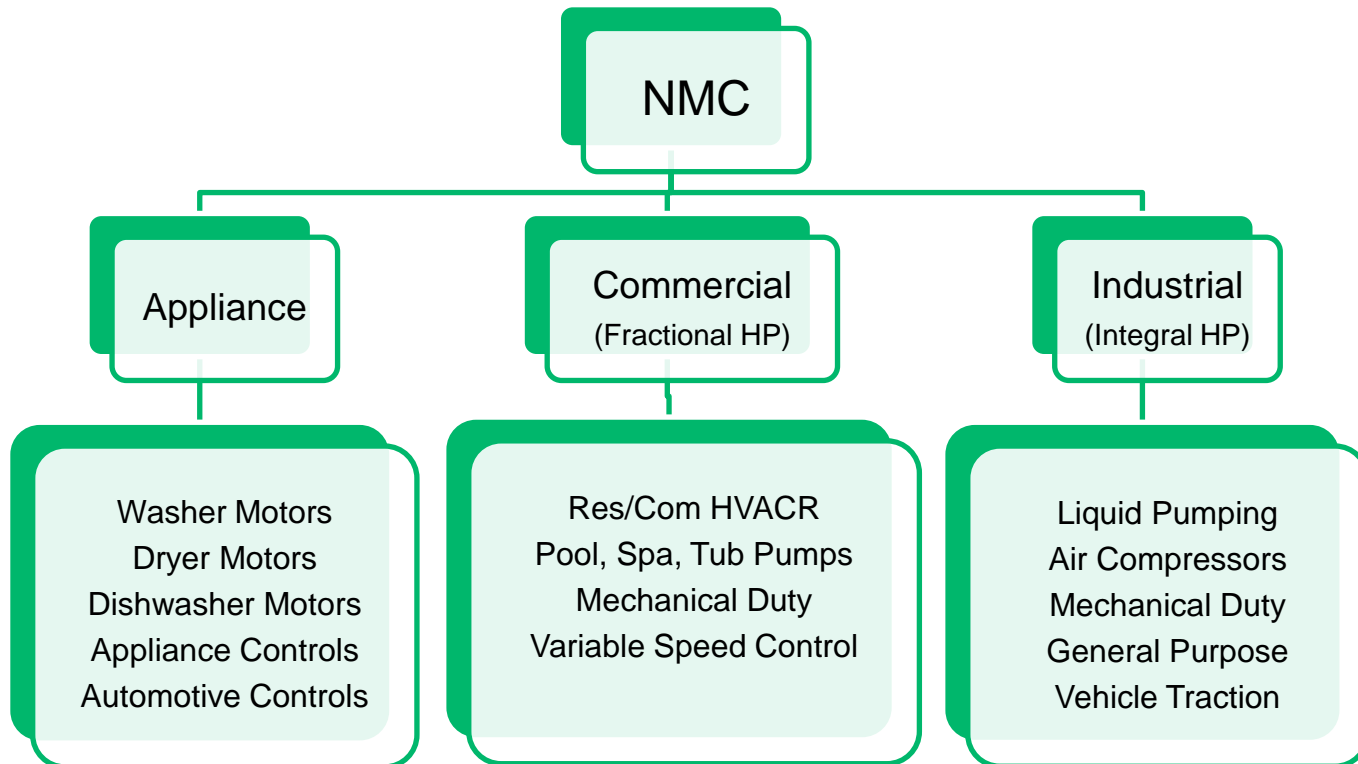
# Overview

- Developed advanced technology in 3 areas of motor technology
  - Brushless DC
  - Induction (blowers, pumps, compressor, gear/belt, direct)
  - Switched Reluctance, SR (hybrid and electric vehicle)



# Overview

- **Nidec Motor Corporation formed Sept. 2010 when acquired by Nidec Corporation of Japan**
  - **Establish North America operations with expanded US sales and customer base, maintaining St. Louis, MO as North American headquarters**
  - **Leverage supply chain, operations, products, technology, customers, marketing channels**



# Nidec Corporate Profile

- **Global Leader in Small and Mid-Sized Electric Motors, Controls, and Related Products**
- **Headquarters in Kyoto, Japan**
- **2011 Sales \$8.5B, Market Cap ~\$12B**
- **Over 100,000 Global Employees**
- **Stock Listing: NJ on NYSE**  
**Tokyo & Osaka Exchanges**
- **Company Founded – July 1973**



**Kyoto Headquarters & Central R&D Facility**



**HDD Spindle Motors**



**Brushless DC Motors**



**Cooling Fan Motors**

# ***Shigenobu Nagamori***

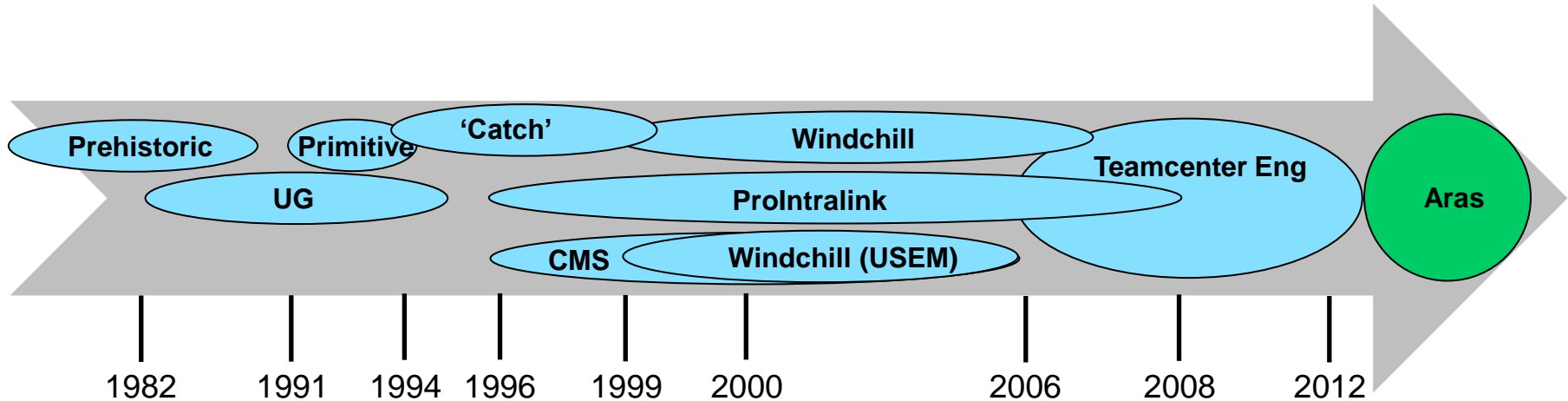
## ***- Founder & CEO of Nidec Corporation***



- **Established Nidec Corporation in 1973 as an Electrical Engineer at age 28**
- **Select by Barron's as one of "The World's Thirty Most Respected CEOs"**
- **Ranked 3<sup>rd</sup> in Japan's top 100 corporate leaders by Nikkei Business**
- **Selected as "Business Statesman of the Year in Japan" by Harvard Business School**
- **Author / Co-author**
  - **Definitive Technical Reference Books on Brushless Motor Technology**
  - **General Management Books on Human Resource Management and Motivation**



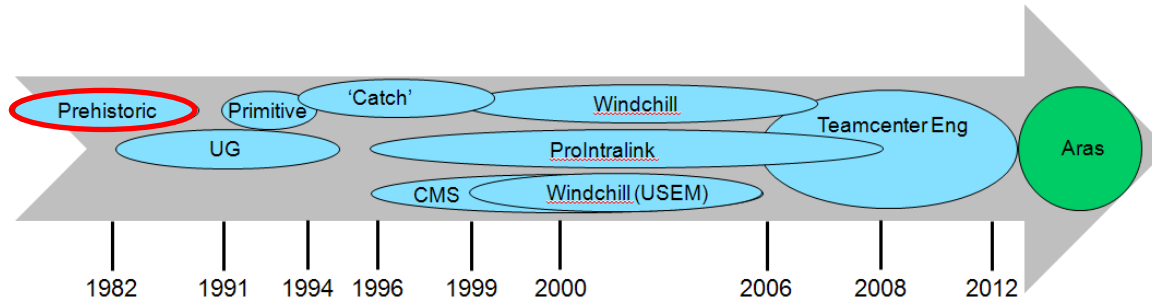
# Nidec PDM/PLM timeline



- **Prehistoric**
- **UniGraphics** file manager
- **Primitive** revision control by folder/filename conventions (for Claris CAD)
- Homegrown '**Catch & Release**' (for MicroStation files)
- **Prolntralink** for ProEngineer model/drawing files
- **Windchill** replaces 'Catch & Release'
- US Electrical Motors merges with Emerson Motor Company (Oct 2000)
  - brings **CMS** and separate **Windchill** installation
- 4 systems combined into **Teamcenter** Engineering
- **Aras** Innovator replaces TcEng



# Prehistoric

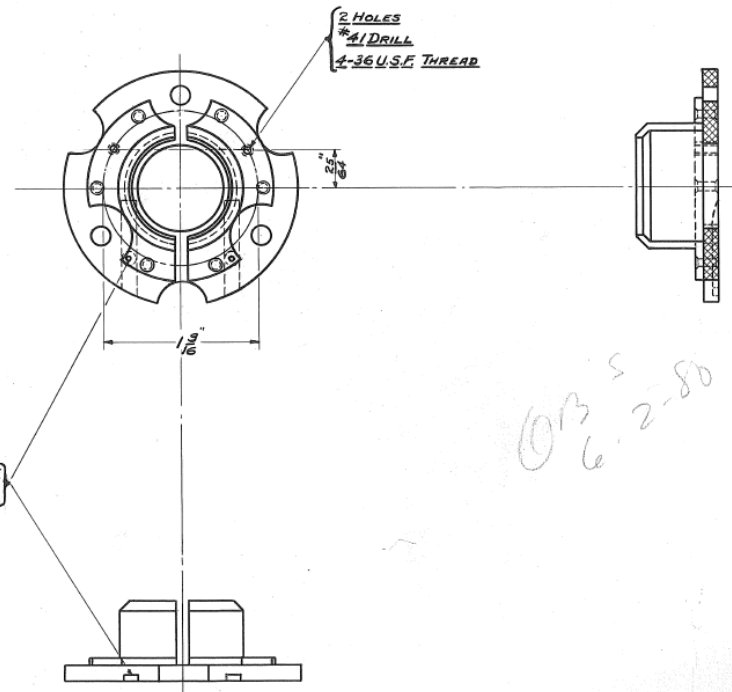


- Drawings created with Tsquares, 4H lead, vellum, sepia prints, etc.
- Processes controlled by policy, managed by people
- Documentation archived in drawing file cabinets, binders and ledgers
- Control of product iteration

## Early drawing (Prehistoric)

ST. LOUIS

DRAWN BY C.D.P.	DATE 7-31-12
TRACED BY C.D.P.	DATE 7-31-12
CHECKED BY	DATE 7-31-12
<b>CHANGES</b>	
<i>DRG WAS OBSOLETE VHS. D.</i>	
<i>12-14-51</i>	



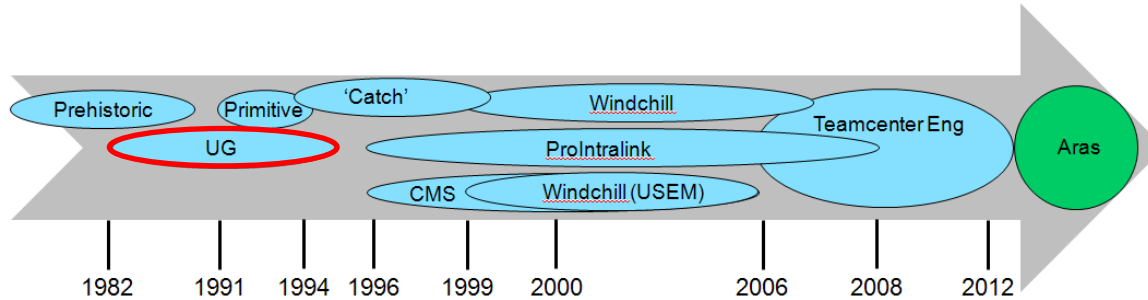
CODE X67 VAR 000

*SAME AS 1510 EXCEPT 2 TAPPED HOLES FOR TERMINAL SCREWS.*

*7342 RQ*  
**ASSEMBLED VIEW**  
**OF CONTACT RING.**

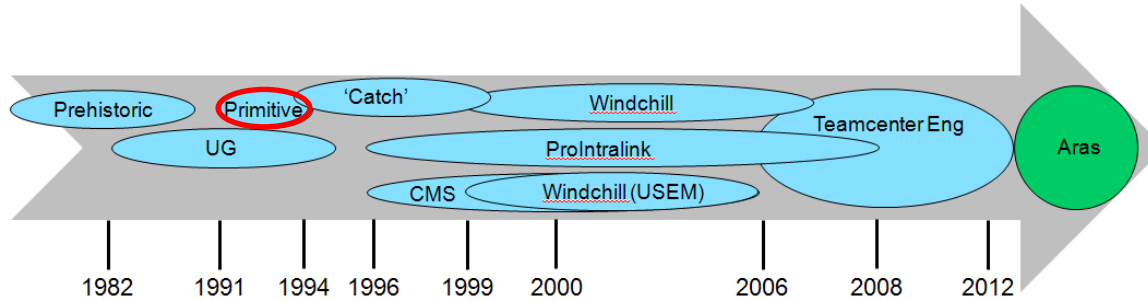
THE EMERSON ELECTRIC MFG. CO  
 ST. LOUIS U.S.A.  
 SCALE FULL SIZE NO. 12037-B

# UniGraphics managed



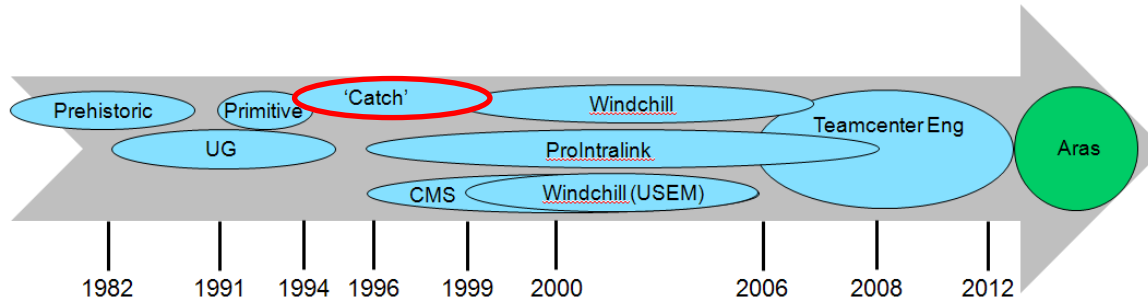
- **Business driver**
  - Electronic drawings – CADD
  - Good sales people
- **Complexity**
  - Sophisticated workstations for traditional draftspeople
- **Challenges**
  - Training
  - Understanding
- **Lessons learned**
  - Provide exposure of tools to end users
  - Have actual knowledge of what the tool (hardware & software) is doing

# Primitive Document Management



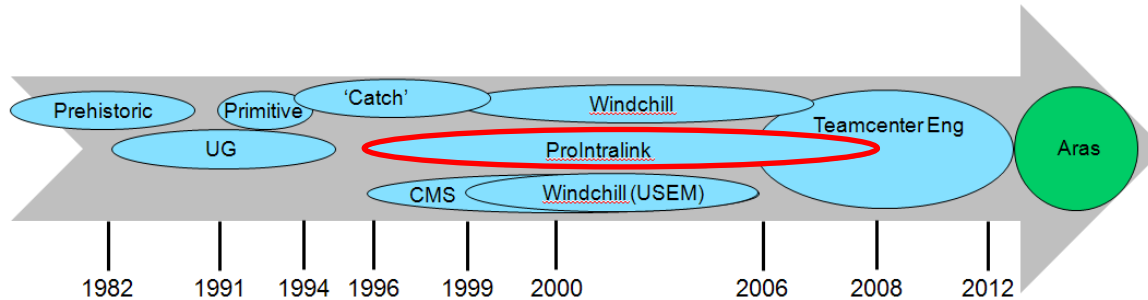
- **Business driver**
  - Sanity for all users of Claris CAD
- **Complexity**
  - Basic revision functionality through folder creation with file renaming
- **Challenges**
  - Cementing user practices
- **Lessons learned**
  - “Got to be a better way”
  - Hire someone with some practical knowledge
  - Knowledge transfer and mentoring

# 'Catch & Release'



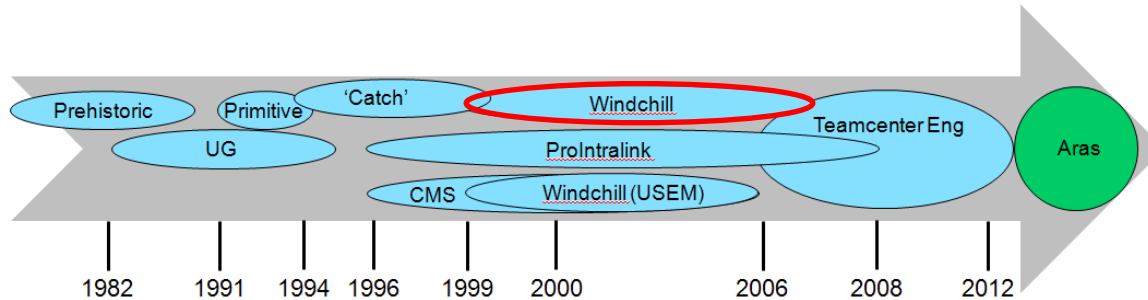
- **Business driver**
  - In-house knowledge/programming skills
- **Complexity**
  - Completely 'homegrown' system
  - Simple interface
  - Version management through 'Drydock'
- **Challenges**
  - Original developer left company
- **Lessons learned**
  - CAD tool integration a must
  - Watch out for specific platform ties

# Prolntralink



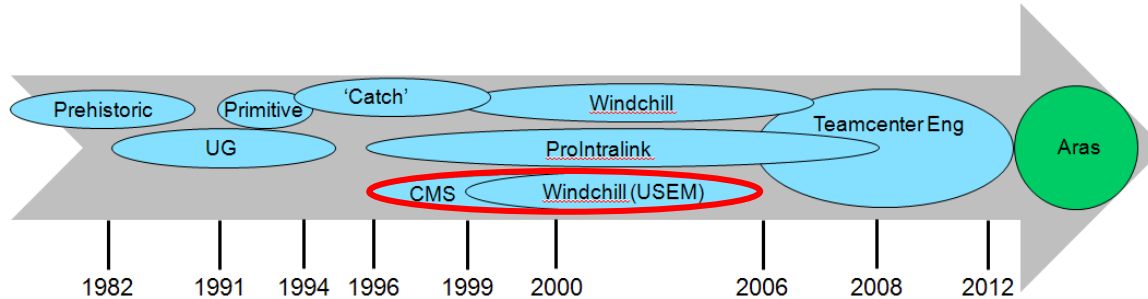
- **Business driver**
  - Single source management of ProE files
  - 3-D modeling tool
- **Complexity**
  - Installation, configuration, administrative nightmare
  - End-user training required but integrated to ProE
- **Challenges**
  - What to do about viewing? (ProductView from PTC)
- **Lessons learned**
  - CAD modeling standards absolutely necessary

# Windchill



- **Business driver**
  - OTB solution for drawing management
  - Release control through workflow & lifecycle management
  - Open integration through use of Java API
- **Complexity**
  - Web-based allowed for simplification of UI
- **Challenges**
  - Upgrade from V2.0 to V4.0 was several month transition
  - No integration with ProE, initially
- **Lessons learned**
  - Customizing for simplicity results in a lifetime commitment
  - ‘KNOW YOUR PROCESSES’ beforehand

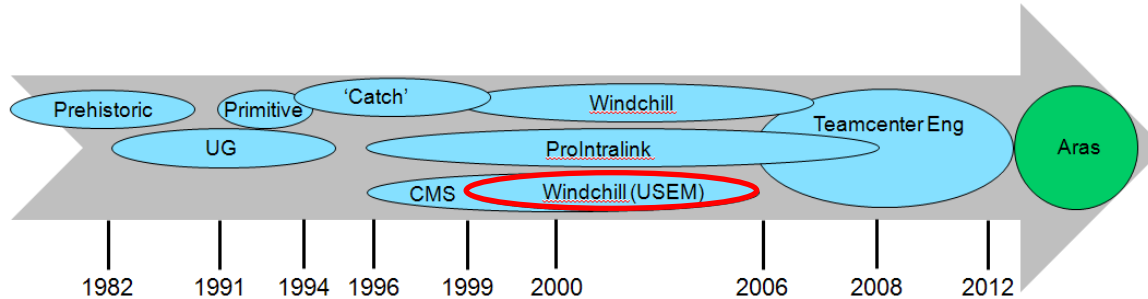
# USEM Implements CMS



- **Business driver**
  - Needed ProE model / file control
  - Recommendation by consultant as best solution for ProE
- **Complexity**
  - OTB installation, very little customization
  - CAD independent
- **Challenges**
  - What to do about viewables created from .drw files?
  - Train the trainer methodology
- **Lessons learned**
  - It just worked

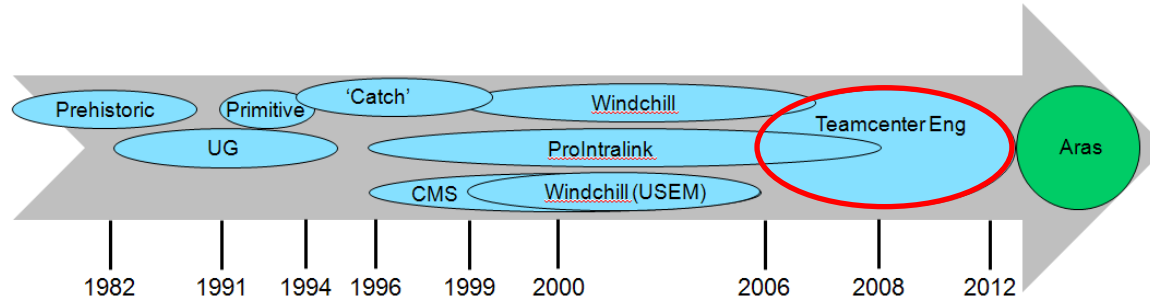


# USEM Implements Windchill



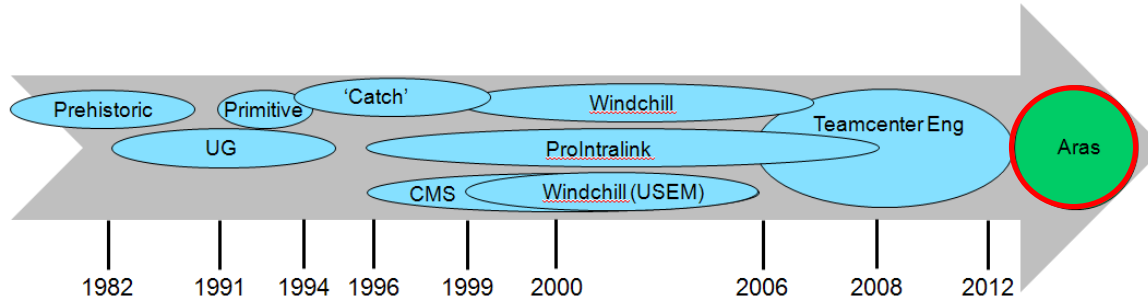
- **Business driver**
  - Online viewing and distribution
  - Workflow / Release functionality - need for control of viewables
- **Complexity**
  - Hidden by consultation
- **Challenges**
  - Convergence to a single Life Cycle
  - Conversion from aperture cards to viewable files
- **Lessons learned**
  - How to implement offshore outsourcing with India resources

# Transition to Teamcenter Eng



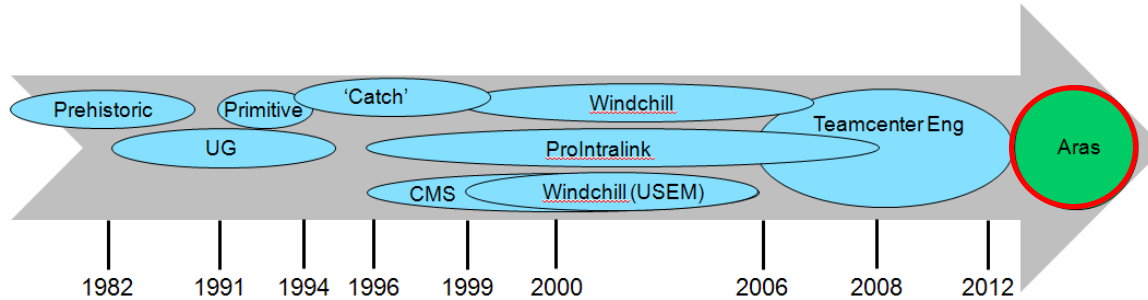
- **Business driver**
  - Emerson corporate decision
- **Complexity**
  - Combining 4 separate PLM systems into one
  - Maintaining global ‘collaboration’
- **Challenges**
  - Getting divisional time for data correction/cleansing
  - Revision migration wasn’t in the cards
  - Seamless integration of pre-existing processes and functionality
- **Lessons learned**
  - Emerson Teamcenter CoE
  - Relearned that hiring knowledgeable resource is invaluable

# Switch 'flipped' to Innovator



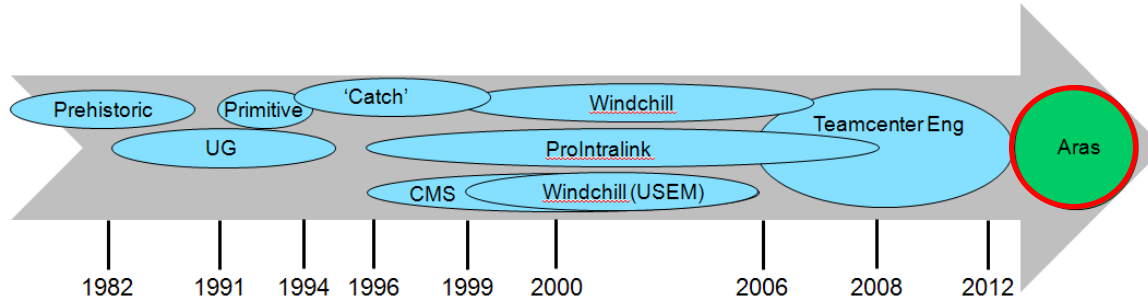
- **Business driver**
  - Loss of volume leverage compounded by costs associated with additional TC modules
  - Replication functionality existed to resolve ProE global usage
- **Complexity**
  - Entire revision migration (ProE especially)
  - Maintaining continuity for end users through migration
- **Challenges**
  - Aggressive time-frame (5 months max )
  - Seamless integration of pre-existing processes and functionality
  - Migration resources with TC knowledge
- **Lessons learned**
  - Reaffirmed that access to software is indispensable for learning

# Observational Summary



- **We were CAD centric in vision**
- **Version control was a must**
- **We built an understanding of process management along the way**
  - 'in-house' developed systems for ECN/ECO, parts definition, classification
  - Collaboration with BPI teams

# Observational Summary



- **Get people 'up to speed'**
- **Enable users to be more productive**
  - CAD integration
  - Enhance functionality
- **Establish standards and make them known**
- **Engage with your other corporate divisions**

# Aras Innovator at NMC

- **Current Implementation**

- Subscribers at version 9.3 SP4
- Pro/Engineer integration
- Replication to China
- Customized 'Cad Document' and custom 'NMC Eng Document'
- Custom created Life Cycle maps
- Custom external web services

- **Project Statistics**

- 2 Teams
  - NMC – Project Manager, CAD & User admin, Infrastructure & Migration & Development
  - Softech – Project Manager, TC migration expert, Innovator load expert
- Pre-project strategy and discovery – May 2012
- Admin and developer training – June/July 2012
- Aug. 1, 2012 – Dec. 12, 2012 (19 weeks – with data migration)
- Additional 3 weeks for replication
- **215,000 TC item masters**
- **representing 290,000 total item revisions**
- **encapsulating 320,000 files**

# ***Aras Innovator future at NMC***

- **Prototype projects**
  - Project management – IT project to upgrade globally used system
  - Custom application for design layout and printing of labels
  - Competitive analysis tool
  
- **Serious investigation**
  - ECAD integration with component library consolidation
  
- **Future**
  - Part/BOM implementation
  - Parts classification
  - ECN/ECO integration
  - NPD tool
  - External applications for Product Data re-implemented

# ***Aras Innovator vision for NMC***

- **We plan:**
  - Mapping our current processes for BOM control
  - Re-examining our current NPD process and tool
  - Reevaluating our current product definition / classification tools
  - Extending studies into areas where we have begun prototyping solutions to attain a better understanding the capabilities of Aras Innovator
- **Based on the results, we will hone our vision for how to best utilize and integrate Aras Innovator into our business, and finally create a roadmap for implementation.**