Global New Product Development

Implementing Successful Transformational Change

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Global R&D Effectiveness
Topic Outline

Snapshot of Carestream Health Inc.
Globalization – The forcing function
Insights for setting up a successful transformation
Learnings Summary

An overview of the Carestream Health project will be presented later in the conference.
Carestream Health – Who We Are

An independent company with a proven track record and $2.5 billion in revenue

A world leader in:

- Medical imaging … digital and film
- Healthcare information solutions
- Dental imaging and dental practice management software
- Molecular imaging
- Non-destructive testing
Who We Are

Approximately 7,300 employees serve customers in more than 150 countries worldwide

We hold more than 1,000 patents for technology and intellectual property

Our products are at work in 90 percent of hospitals worldwide
Who We Are

A global company with Manufacturing and R&D locations around the world
The Globalization Challenge

Globalization was required to meet the business needs of our company

• Needed a balanced cost structure
• Desired access to global talent pools
• Required deeper understanding of emerging markets

Business Challenges

• Legacy Systems were outdated and not easily scalable
• Lack of adequate IT investment resulted in non integrated point solutions
• Collaboration became more difficult via e-mail, uncontrolled data with partners
• IT Infrastructure and networks were performing poorly in some parts of the world
• Complexity in the organization increased as projects decentralized
• Knowledge workers time was being drained communicating globally
• Productivity of NPD remained roughly flat
Legacy-Point Solutions lacking proper architecture and investment

**Authoring**
- MCAD Tools
  - NX
  - Pro/E
  - SolidWorks
  - AutoCAD
- ECAD Tools
  - Mentor DX
  - Cadence
  - OrCAD
  - Altium
- Software Authoring
  - Desktop Tools (Browser, MSOffice, etc)

**PDM**
- Teamcenter
- Pro/Intralink
  - ME File
  - Shares, library
  - cache
- Pro/Intralink
  - EE File
  - Shares, library
  - cache
- Pro/Intralink
  - CAD Files PDFs
- Pro/Intralink
  - CAD Files PDFs

**Part Data**
- EQDS
  - No Integration
- BOM
  - Lotus Notes DB
  - CAPA
  - Sys 9K
  - SOP
  - DA
  - MMR
  - Lotus Domino
  - DocManager

**Enterprise**
- MQDS
  - No Integration
- SAP
  - No Integration
- External Systems

**Version Control Tools**
- Clearcase
- PVCS
- Subversion
- StarTeam
- Quality Center

**Defects**
- CQuest
- Enhancement
- Requests

**DOORS Requirements Management Tools**
- Caused by “Cost Center” mentality

Caused by “Cost Center” mentality

Information Flow
- Manual Integration
- Automated Integration
- Confluence
- Excel
- MS Project
- Team Room
- RoHS, DoC, MSDS (no home)
- Lotus Notes DB
- CAPA
- Sys 9K
- SOP
- DA
- MMR
- Lotus Domino
- DocManager

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Demands on NPD Workers Are Increasing

- Project teams are split across several locations
- Platform development is adding complexity in software and hardware
- Iterative methods are desired for software and require fast information transfer
- Daily builds are a common expectation for software
- Fast cycles are required for prototyping hardware
- Design for manufacturability is critical as ties to supplier base become weaker
- Teams must leverage historical data to improve planning, compare reliability, and drive improvements
- Engineers are pushed to do deeper analysis to ensure product quality while coordinating many sources of information
- Requests for metrics and historical data comparisons are ever increasing and are taking longer to produce
Our future success required

- A Leadership organization stepping up to create awareness, develop strategy and drive change to improve operations
- Architectural awareness and maturity in design of enterprise systems
- Careful integration strategies between applications- PLM-ERP-ALM
- A master-data strategy - removal of duplicate data sources and multiple manual data entry points
- Closed-loop processes with traceability across the process space
- Product/HW systems optimized for access and collaboration
- SW systems optimized for fast cycles and traceability
- Retention of all forms of Intellectual Property, internal and external, to retain “business flexibility”
- Tight integration and traceability across requirements, project management and engineering change control to meet regulatory requirements
Hitting the target- It's not just a simple arrow anymore

Technology Driven → Performance Driven

People
- Change Management
- Communications

Global Leadership
- Strategy
- Awareness
- Leading multi-Cultural Change

Global and Distributed

Closed Loop
- Standard
- Inclusive
- End to end

Co-located and Focused

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Considerations required for Enterprise Transformation

• Complete view of New Product Development “building blocks”
• Appreciation of the complexity in the “layers”
• Architectural orientation and familiarity with industry technology
• Process understanding and balance
• Training
• Reporting structure and governance
• Ubiquitous platforms
• Complete teams designed for success
Complete View – Understanding the Building Blocks

Portfolio – Dashboards, Metrics, Web Channels

PLM – Product Life Cycle Management Platform

PDM – Data Management for Hardware

ALM – Data Management for Software

Hardware Design Authoring – CAD-ME,EE

Software Design – Authoring IDE

Integration of Applications and Master Data Strategy

BOLD=Industry Term
Appreciate the Complexity in each “Block”

**Presentation Layer**
Web Channels internal and external Social, Dashboards, BI

**Business Process Layer** - Standard Workflow and Responsibilities
(Engineering Change Control, Production Release Process,
Supplier Quote Process, Defect Management Process)

**Application Layer**
Aras Innovator, Teamcenter, Doors, Clearquest and Clearcase

**Data Layer**
System of Record for Master Data, Attributes, Field Mapping to Metrics, clean-up

**IT Infrastructure Layer**
Networks, Servers, Databases, Storage, Back-up, Archive

Increase Organizational Maturity + Architectural Awareness = Success
Architectural Orientation and Strategic Planning Ability

Enterprise Systems

- PLM Aras Innovator
  - Closed Loop Engineering Change Management (HW/SW)
  - Event Tracking and Defect Mgmt
  - CAPA Management
  - Audit Management
  - Supplier Access/ DFM Input
  - Supplier Quote
  - ECAD, MCAD PDM Integrations
  - EBOM, MBOM Management
  - Costing
  - Commercial Parts Library
  - RoHAS
  - Requirements Change Control
  - ISDE Integration for SW events

Knowledge Sharing, Social Nets and Webchannel

- Webchannel/Social Development
- KM Platform
- LN DBs

Manufacturing Transfer

- Raw Material Master
- SAP
- Integrated As Built Master Data
- Purchase Portals – ECoutlook
- Smart source-Ebid

Authoring Systems

- Desktop Office, Project
- MCAD Tools Supplier 1
  - Supplier 2
  - Supplier 3
  - New Modeling
- ECAD Tools
  - ECAD 1
  - ECAD 2
  - ECAD 3
- SW Authoring
  - MS Visual Studio
  - XCODE, Other Key IDEs
- ISDE Core
  - CM-STD
- RQMTS
  - New Platform
- Testing
  - Quality Platform

Integrated SW Development Environment - SW Environment

- SW Project Management, Dashboards
  - Build Tools and Services. Test Scripting Build Configuration Management
  - Some Integration

- Integrated EBOM, MBOM Management
- Costing
- Commercial Parts Library
- RoHAS
- Requirements Change Control
- ISDE Integration for SW events

- New Platform
- SW Project Management, Dashboards

- New Supplier 1
- Supplier 2
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Key Points

- Drives deeper “use case” discussions
- Refines functional requirement understanding
- Concentrates people on future state and consistency vs current state, holding on to today

Swim Lanes Organization Independent

- Focuses training development on process not button clicks
- Focuses test plans for validation on key workflow performance
Process Balance Yin-Yang

Suppliers and Partners

Innovation

Requirements

Defects

Research

Concept

Product Lifecycle Management

Requirement Management

Application Lifecycle Management

Product Data Management

Enterprise Resource Planning

Stable Reproducible

Testable Trackable Flexible Collaborative

Balanced representation from Subject Matter Experts on both ends of the process spectrum
Training

- Technology and Process are complex, skimping on training leads to inefficiency and slow adoption
- Train in the context of business process not Technology “button clicks”
- Carefully identify the roles that require training and target information
- Evaluate self paced training, it’s the hardest to deliver but most flexible for users
Reporting Structure and Governance

CTO Office

CIO Office

Alignment with IT
- Ensures Scalability
- Architectural focus and alignment
- Improved on-going services
- Leverages strengths of both groups

Business Structure
- Sponsors
- Subject Matter Experts
- Middle Managers
- Finance

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Choose “Ubiquitous” Platforms and “Real” Partners

- Platforms must scale globally
- Provide a cost model in line with business benefit
- Allow web access with solid security
- Enable flexible configuration and integration
- Deliver user performance globally
- Allow for growth over time
- “Real” partners provide a strategic relationship
  - Share in risk
  - Offer flexible terms in line with business needs
  - Partner during implementation
  - Keep costs in line with benefits
Aras “Attitude” and Advantages

• Cost model allowed global scale
• Flexible architecture enabled rapid development
  50% easier than other platforms
• Web based, scalable cost model…
  key to ubiquitous access
• Ties to MS Sharepoint, which is being evaluated
  for the enterprise
• Good Technical Partnership – Anti-virus performance,
  E-Signature help
• Some risk but balanced with High Value
• Community concept, that we hope to better leverage
Complete Teams = Successful Results

All skills are critical and equal for success
Learnings to Date

• Mindfully consider the elements required for success…
• Carefully craft your team, leadership awareness, project management, and communications skills
• Set project governance and decision rights formally
• Determine your internal critical mass and match with implementation partner development speed
• Ensure business-process work leads and requirements follow
• Work in parallel with master data modeling and migration tests
• Train in context of the business process not in context of the tool
• Get involvement of Subject Matter Experts early and often. Cover all disciplines and phases of the lifecycle…. Balance….
• Turn user interface prototypes early, fast and review the implementation approach taken carefully
• Prioritize architecture and code reviews highly; easily skipped
• Verify and Validate functionality using business-process diagrams as basis