Closed Loop Supplier Collaboration
At Mercury Marine
Mercury Marine

- 1939 founded in Cedarburg, WI as Kiekhaefer Corporation
- 1961 acquired by Brunswick
- $2.6 billion in revenue in 2017 (Brunswick parent $4.5 billion)
- 6,000+ employees
- Strategic segments
  - Outboard Engines
  - Inboard, Sterndrives and Jet Drive Engines
  - Racing High-Performance Outboards and Sterndrives
  - Rigid Inflatable and Inflatable Boats
  - Mercury Smart Craft Electronics
  - Engine Parts and Accessories
  - Mercury Digital Services
Mercury Marine Operations

**Fond du Lac Wisconsin**

**Mercury Headquarters**
- Mercury Assembly
  - Plant 15
  - Outboard 25
  - Outboard 4S 75hp+
  - MerCruiser engines & drives
- Mercury Casting
  - Plant 17
- Mercury Machining
  - Plant 4
- Mercury P&A
  - Plant 3
- Mercury Racing
  - Plant 36

**Juarez Mexico**
- Plant 22 Wire Harness

**St. Cloud Florida**
- Electrical & Plastic Assemblies

**Komagane Japan**
- TMC Joint Venture
  - Outboard 2.5-30hp
  - Opened 2005
  - 300k sq ft

**Suzhou China**
- Outboard 4-stroke
  - 40-60hp
  - Opened 2005
  - 150k sq ft
Product Development Tools at Mercury Marine

**CAD Applications & Viz tools in use:**
- Creo MCAD
- Teamcenter Integration with Creo (IPEM)
- Keyshot
- Cortona

**PLM Applications in use:**
- Teamcenter Foundation
- Teamcenter Classification
- Teamcenter Change Management
- Teamcenter Visualization
- Teamcenter Multi Site
- Supplier Relationship Management

**Digital Solutions in use**
- Parts Planning Application (PLM – ERP Tracker)
- Test Request System
- Engineering Knowledge Base
Consulting Practice Founded in 2009

Industries served include:
- Aerospace, Defense, Industrial Machinery, Automotive Supply, Medical Devices, Diversified Manufacturing, Consumer Durables

Digital Solutions include:
- Parts Planning Application (PLM – ERP Tracker)
- Test Request System
- Engineering Knowledge Portal
- Lab Test Management System
- Workflow Analysis Tool
- Teamcenter to SharePoint (Tc2SP)

Digital Services include:
- PLM assessments/Digital Transformation roadmaps
- Business process & value stream mapping workshops
- Project management, Requirements development, Test script development & validation
- Teamcenter architecture, hardware sizing, installation, configuration, workflows, customizations
- CAD to PLM to ERP system integration (IPEM, T4S, T4O, T4EA)
- Data migration services
- Teamcenter upgrades – Active Workspace (usability)
- Training materials creation and delivery
- Teamcenter Help Desk services
Three Business Value Levers

Delivering innovation to drive growth, consistently

- **Drive Innovation**
  - Early supplier collaboration as a tool for innovation supporting co-design and co-development

- **Concept to Production Quickly**
  - Deliver realized concepts to customers

- **Collaboration in the Value Chain**

- **Product Leadership**
  - Be The Best Partner

- **Speed to Market**
  - Compliance

- **Product Leadership**
  - Be The Best Partner
Business Challenges

- Manufacturing of components requires Early Supplier Involvement
- IP Protection & Traceability
- Commercial tie-in to correct, current revision
- Effective Change Control
- Sourcing Integration

Key Objective:

Increase the throughput of early supplier involvement for improved costs and capabilities.
Key Business Requirements

1. Early Supplier Involvement

2. RFQ

EVENT TYPE #1 = DESIGN DATA EXCHANGE

EVENT TYPE #2 = RFQ QUOTE EVENTS

EARLY SUPPLIER INVOLVEMENT

BUDGETARY QUOTES
Mercury Sourcing Transformation

Technology-enabled Sourcing

- Standardized global sourcing process
- Directly integrated with PLM system
- Sourcing process tied to latest design data
- Real-time collaboration
- Workflow, signoff driven
- Transparency & Traceability
- Vendor Management

- Multiple fragmented systems & sourcing process
- FTP method for transferring data
- No tie in to correct cad versions

- Lack of formal/standard sourcing process
- Emails, FTP methods for requesting, communicating, decision making
- No Audit Trail, IP Leakage
Supplier Collaboration Sourcing Process

- **Engineer**
  - Initiates Sourcing Bid Package

- **Procurement Manager**
  - Reviews the New Part requirements
  - Assign suppliers to respond
  - Invites suppliers to bid

- **Procurement Buyer**
  - Reviews bid package
  - Completes response
  - Submits bid

- **Supplier**
  - Reviews bid package
  - Completes response
  - Submits bid

- **Buyer**
  - Analyzes bids
  - Makes sourcing decision
  - Publishes to Teamcenter

- **Procurement Commodity Manager**
  - Reviews quote
  - Approves the Supplier Award

- **Procurement Commodity Director**
  - Reviews quotes
  - Approves Supplier Award

**Integration Framework**

**PLM Foundation**

**SCF – e-Sourcing Web Portal**

**Supplier Collaboration Foundation**
The First Three Years

**Y1**
Defined sourcing business Process

Business Workshops
Define requirements & use cases
Define To Be Sourcing Process

**Y2**
Ensure teams were aligned, deployed POC

Conference Room Pilot
Proof Of Concept Deployment
Refine use cases & system design

**Y3**
Production deployment & focus on boarding

User Acceptance Test
Production Deployment
Train Internal users
External Supplier Training
### SRM Design Data Exchange – Business Outcomes

<table>
<thead>
<tr>
<th>Secure method of data exchange</th>
<th>Access to latest &amp; correct set of design data</th>
<th>Efficient methods to track suppliers and supplier data</th>
<th>Early supplier involvement</th>
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<tbody>
<tr>
<td>• IP protection</td>
<td>• Improved quality</td>
<td>• Objective evidence for audit purpose</td>
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<tr>
<td>• Robust &amp; traceable process</td>
<td>• Eliminate data inaccuracies</td>
<td>• Reporting &amp; transparency</td>
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<tr>
<td>• Eliminate FTP &amp; Emails</td>
<td>• Version control – save on tooling scrap &amp; waste cycles</td>
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<td></td>
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<td>• Prove out design, early identification of designs that are not feasible</td>
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<td>• Understand cost drivers early in the process</td>
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<td>• Accelerates product development cycle</td>
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<td>Effectively manage supplier quotes</td>
<td>Electronic signoffs</td>
<td>Track Metrics</td>
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<tr>
<td>• Cycle time reduction</td>
<td>• Global sourcing process</td>
<td>• Part Level Target costs vs. Actual production costs</td>
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<tr>
<td>• Traceability</td>
<td>• Supplier transaction history &amp; tracking report</td>
<td>• Sourcing process response time</td>
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<td>• Eliminate email and verbal requests for quote</td>
<td>• Supplier bid comparison</td>
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<td>• Project award routing for cross-functional signoffs</td>
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</table>
Decrease new product introduction costs to meet program commitments

Product leadership in global markets through innovative co-design and co-development with suppliers across four continents

Realize faster time-to-market with expectation to cut product sourcing cycle times by 15 to 20 percent
THANK YOU