JPL Year 2000 Project: Management by Processes and Metrics

Robert L. Miller, Ph.D.
JPL Y2k Project Engineering Manager
Jet Propulsion Laboratory,
California Institute of Technology

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Title: JPL Year 2000 Project: Management by Processes and Metrics

Speaker: Robert L. Miller, Ph.D. JPL Y2k Project Engineering Manager
Jet Propulsion Laboratory, California Institute of Technology

Abstract
In 1998, Jet Propulsion Laboratory created an institution-wide project to ensure that no system depending upon information technology (IT) would suffer an interruption due to date-related processing through 2015. Such an undertaking was unparalleled in the number of affected organizations and assets, the shortness of schedule, and the degree of external interest.

In order to meet this challenge, the JPL Y2k Project adopted the following approach:

- Provided universal and unambiguous statements of requirements, processes, and procedures
- Compiled an unprecedented database about JPL IT assets and plans
- Created real-time, web-based, context-sensitive metrics
- Reviewed progress on the above items, on a weekly basis, with a Project team having representatives from every major JPL organization

These steps ultimately culminated in an uneventful, and thereby successful, transition to 2000.
Year 2000 Project Objectives

- Full Year 2000 Compliance for JPL
  - Operational Systems
  - Desktop Computers
  - Facilities
  - Business Systems
  - Laboratories
  - Others

Presentation to ACM
History: Few Believers in 1998

- Frequent Responses by Engineers
  - Only Affects Business Systems
  - My Code Was Designed Compliant

- Frequent Responses by Managers
  - No Time
  - No Available Work Force
  - No Money
  - Existing Commitments Will Slip
Year 2000 Project Approach

- Obtain Executive Management Support
- Meet Weekly with Representatives from Line and Funding Organizations
- Document Formal Compliance Process
- Provide On-Line Real-Time Metrics and Reports

Presentation to ACM
Process-Based Approach

- Issued Y2k Inventory Policy Applying To:
  - IT Products or Services that are Delivered to Other Organizations
  - Items Used to Develop or Support a Product or Service Delivered to Other Organizations
  - Items Used to Support the Development or Operation of Another Y2k Inventoried Item
  - Hardware with Embedded Information Processing Elements

- Y2k Compliance Requirements Document

Presentation to ACM
Process-Based Approach

- JPL Y2k Project Provided
  - Input Screens for On-Line Inventory Database
  - Certification and Waiver Procedures Using Electronic Signatures and File Archive
  - Independent “Witnesses” of Y2k Documents
  - Code Filtering Services for Developers
  - Generic Test Worksheets
  - COTS Product Y2k Status, Patches, and Internal Analyses
  - Desktop Computer Sticker Process
Process-Based Approach

- Development Organizations Provided for Each Inventory Item
  - Description Including Supporting COTS Products
  - Certification or Retirement Plans
  - Code Inspection Report
  - Y2k Test Facility, Test Data, and Sys Admin
  - Test Procedures and Report

- Development Organizations Also Provided
  Desktop Computer Y2k Plans and Status

Presentation to ACM

rilm-8
4/5/2000
<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record enter date</td>
<td>2000-02-02</td>
</tr>
<tr>
<td>Name of Cognizant Development Engineer(s) (comma delimited)</td>
<td></td>
</tr>
<tr>
<td>Name of Responsible Program Office/Individual</td>
<td></td>
</tr>
<tr>
<td>Responsible Individual for Inventory Item Testing</td>
<td></td>
</tr>
<tr>
<td>Planned Completion Date (yyyy-mm-dd)</td>
<td>Code Filtering</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Completion Date (yyyy-mm-dd)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Planned Completion Date (yyyy-mm-dd)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Completion Date (yyyy-mm-dd)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List of Support Products if any

Comments (limited to 255 chars)

Comments (Y2K Project Office Use Only, limited to 255 chars)
### Y2k Certification Record

**C - JP1 Implemented System**

If you have problems or questions concerning this data, see the Reqs Listing.

<table>
<thead>
<tr>
<th>Record</th>
<th>File</th>
<th>Life Cycle</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify</td>
<td>Cancel</td>
<td>Electronic Signature</td>
<td>View Record History</td>
</tr>
<tr>
<td>Files</td>
<td>Un/Reserve</td>
<td>Waivers and Certificates</td>
<td>Login/Out (admin)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Format for Print</td>
</tr>
</tbody>
</table>

**Node:**

**BROWSE**

**Y2k Inventory Item Number:** 0005000

**Inventory Item Name:** None

**Mission Criticality:**

**NON-CRITICAL**

**Risk Level:**

**N/A**

**Cogn. Individual:**

None

**Number of Files Attached:**

1

**Reserved by:**

**Reserved on:**

**Reason:**

**Notes:**

None

**Release Status:**

"Preliminary Phase"

**Revision:**

**Date Record Created:** Pending
Y2K 0005000;1@PRELIMINARY

Select a file from the list and click on one of the following options:

- Attach New File
- Detach File
- Check Out
- Check In
- Copy Out
- Make Active File
- Mark As Multiple

Multi-File Document  ✓ Active File

Attached Files:

<table>
<thead>
<tr>
<th>File ID</th>
<th>File Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARTOON TRNG IA.DOC</td>
<td>07-MAY-1998 09:27:24</td>
<td></td>
</tr>
</tbody>
</table>

Download and configure PTC's Product View for viewing CAD files.

Multi-File Document  ✓ Active File
## Release History of Y2K record 0005000

### Key Information
- **Certification Obsolete**
- **Certified by Project Manager**
- **Signed by Witness**
- **Signed by Supervisor**
- **Signed by Cog-E**
- **Attached Code Inspection Report**
  - **Comments?**
- **Attached Test Report**
  - **Comments?**

### Details
- **Created**
  - **Date:** 28-Jan-2000
  - **Time:** 09:47:39
  - **Author:** Li-Yu Sung

- **Preliminary Phase**
  - **Date:** 17-Feb-1999
  - **Time:** 09:58:57
  - **Author:** SHERPA
### Y2k Waiver Record

**A - Variance from Minimum Test Requirements**

<table>
<thead>
<tr>
<th>Record</th>
<th>File</th>
<th>Life Cycle</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify</td>
<td>Cancel</td>
<td>Electronic Signature</td>
<td>Un/Reserve</td>
</tr>
</tbody>
</table>

**Mode:** BROWSE  
**Y2k Waiver Number:** 1  
**Reviesion:** -  
**Release Status:** "Created"

**Waiver Name:** None

<table>
<thead>
<tr>
<th>Mission Criticality:</th>
<th>Vendor Certified (COTS Only):</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Risk Level:** N/A  
**Responsible Org No.:** 0

**Cog. Individual:** None  
**Supervisor:** None

**Number of Files Attached:** 0  
**Date Record Created:** Pending

**Notes including a List of Affected Inventory Item Numbers:**

**Please type no more than 10 lines.**

Reserved by:  
Reserved on:  
Reason:
Essential Metrics

- Large Number of Heterogeneous Transactions Drove the Need for On-Line Database and Metrics
  - Thousands of Desktop Computers with Many Operating Systems
  - Hundreds of Internal Inventory Items
  - Hundreds of COTS Products
  - Hundreds of Documents to Review
  - Hundreds of Schedules to Track

Presentation to ACM
### Netscape: Metrics By Responsible Organization Selection Screen

<table>
<thead>
<tr>
<th>Select Responsible Organization</th>
<th>JPL System ID</th>
<th>Responsible Individual</th>
<th>Select only j-coded item</th>
<th>Phase</th>
<th>Criticality</th>
<th>Display Discrepancy Lists</th>
<th>Cumulative</th>
<th>Time scale</th>
<th>Start</th>
<th>End</th>
<th>Cumulative</th>
<th>Time scale</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ 1xx ○ 2xx ○ 31x ○ 32x ○ 33x ○ 34x ○ 35x ○ 38x ○ 39x ○ 3xx ○ 4xx ○ 5xx ○ 66x ○ 6xx ○ 7xx ○ 8xx ○ 91x ○ 92x ○ 93x ○ 94x ○ 95x ○ 96x ○ 98x ○ 99x ○ 9xx ○ JPL</td>
<td></td>
<td>○ Renovation ○ Validation ○ Implementation ○ Certification ○ Retirement ○ Mission Critical ○ Non-mission Critical ○ Both</td>
<td></td>
<td>○ Yes ○ No</td>
<td>○ Yes ○ No</td>
<td>○ Yes ○ No</td>
<td>○ Yes ○ No</td>
<td>○ Monthly</td>
<td>Aug 1998</td>
<td>Jan 2000</td>
<td>○ Yes ○ No</td>
<td>○ Weekly</td>
<td>11/01/1999 to 11/07/1999</td>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>
Renovation Status of Applications Responsible by JPL

Time, Calendar Month
Validation Status of Applications Responsible by JPL

- Inventory Size
- Planned (cumulative)
- Actual (cumulative)

Time, Calendar Month
Certification Status of Applications Responsible by JPL

{ts '2000-01-27 16:15:37'}

- Inventory Size
- Planned (cumulative)
- Actual (cumulative)
- Untouched (cumulative)

Time, Calendar Month