A Story About Dinosaur Called Mainframe and a Small Fly Agile

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Experienced Report
Learn by Examples
Imagine a MAINFRAME
Imagine a MAINFRAME

Once, long time ago, there was a very old dinosaur living on the planet Earth. Big yet invisible to most, living in the dark places full of cold, dust and cables; surrounded by several groups of faithful - very specialized software teams, the only ones who truly understood him. But the life on the planet Earth had never been steady and recently spinning faster and faster around, so it happen that even this group had to be changed and follow the fast changing business environment outside, unless they all die. And here our story begins.
GREEN screen menu

02L908       THE UNIVERSITY OF CONNECTICUT       UCC10

*****************************************************************************
WARNING! Attempts at unauthorized access to systems may result in penalties
in accordance with University security policy and State and Federal statutes.
Sessions & E-Mail may be monitored at the University’s discretion.
** NOTE: SYSTEM May be Down for Maintenance Between 5:30 – 7:30 A.M.
*****************************************************************************

For assistance, please call the Help Desk at 486-HELP

PTION   DESCRIPTION       HOURS of AVAILABILITY: (** See NOTE Above)
A CMS (All Supported Products)       Daily 24hrs. **
B HOMER UCONN Libraries System       At CMS Ready Prompt type: help uconn homer
C UCLID Class INFO Display           M-TH 0800-1900; F 0800-1730; SAT 0800-1700
D UCONNECT Phones/UCONN E-Mail       Daily 24hrs. **
E Student Access System              M-TH 0800-1900; F 0800-1730; SAT 0800-1700
XIT Exit from this Dialed Session

Enter your Selection ===>
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Settings</td>
<td>Terminal and user parameters</td>
</tr>
<tr>
<td>1</td>
<td>View</td>
<td>Display source data or listings</td>
</tr>
<tr>
<td>2</td>
<td>Edit</td>
<td>Create or change source data</td>
</tr>
<tr>
<td>3</td>
<td>Utilities</td>
<td>Perform utility functions</td>
</tr>
<tr>
<td>4</td>
<td>Foreground</td>
<td>Interactive language processing</td>
</tr>
<tr>
<td>5</td>
<td>Batch</td>
<td>Submit job for language processing</td>
</tr>
<tr>
<td>6</td>
<td>Command</td>
<td>Enter TSO or Workstation commands</td>
</tr>
<tr>
<td>7</td>
<td>Dialog Test</td>
<td>Perform dialog testing</td>
</tr>
<tr>
<td>9</td>
<td>IBM Products</td>
<td>Additional IBM Program Products</td>
</tr>
<tr>
<td>10</td>
<td>SCLM</td>
<td>SW Configuration Library Manager</td>
</tr>
<tr>
<td>11</td>
<td>Workplace</td>
<td>ISPF Object/Action Workplace</td>
</tr>
</tbody>
</table>

User ID : O2A031
Time. : 14:55
Terminal : 3278
Screen. : 1
Language. : ENGLISH
Appl ID. : ISR
TSO logon : $O2AUSER
TSO prefix : O2A031
System ID : BIGIRON
MVS acct. : GENERAL
Release. : ISPF 5.5

Enter X to Terminate using log/list defaults

F1=Help  F2=Split  F3=Exit  F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel
### ISPF Screen Panel

#### Menu Options
- **Menu**
- **RefList**
- **Utilities**
- **Help**

#### Data Set Utility

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Allocate new data set</td>
</tr>
<tr>
<td>R</td>
<td>Rename entire data set</td>
</tr>
<tr>
<td>D</td>
<td>Delete entire data set</td>
</tr>
<tr>
<td><em>blank</em></td>
<td>Data set information</td>
</tr>
<tr>
<td></td>
<td>C Catalog data set</td>
</tr>
<tr>
<td></td>
<td>U Uncatalog data set</td>
</tr>
<tr>
<td></td>
<td>S Short data set information</td>
</tr>
<tr>
<td></td>
<td>V VSAM Utilities</td>
</tr>
</tbody>
</table>

#### ISPF Library:
- **Project**...OZA031
- **Group**...rajes34
- **Type**...COBOL

#### Other Partitioned, Sequential or VSAM Data Set:
- **Data Set Name**
- **Volume Serial**

(If not cataloged, required for option "C")

#### Data Set Password
(If password protected)

#### Key Combinations:
- F1=Help
- F2=Split
- F3=Exit
- F7=Backward
- F8=Forward
- F9=Swap
- F10=Actions
- F12=Cancel
The following defines a packed decimal number
of a certain length, and an edit word and output area
for that number, in such a way that
definitions are still valid if the length
has to be changes

NUMLEN EQU 5 No. of digits required
INTNUM DC PL(NUMLEN/2+1) '0' Packed version
EDITWORD DC C' ' Fill char

DC(NUMLEN)X'20'
  ORG *-2 Overlay penultimate byte
  DC X'21'
  ORG , Significance start ind.

OUTLEN EQU *-EDITWORD Length needed for output
OUTPUT DS CL(OUTLEN) Output area
How did we start?

Discover top 5 problems we were facing.

Can agile work for mainframes?
Huge. 14 millions lines, no documentation.
No classes or clear structure. Full of macros and optimization trick instructions for segmentation, paging, memory management.
No coding standard, no understanding. All we know is hidden in memories.
25 year old code. Refactored and migrated many times.

#1: Legacy Code
Team is sharing knowhow. Boost learning.

Sit together in one room.

Involve team in the decisions and processes.

Implement pair programming. Rotate the pairs.
Source code repository (SCLM), missing collaboration, merging, and branching support. Almost no test automation, no way to generate tests, no unit test assembler framework. Debugging based on system dumps.

#2: Lack of Tools
We found no good solution to 30+ years old test. Spent 2 man-years creating clear test strategy in QC and stabilize tests. Automate few tests by selenium based framework. Improve communication and planning to limit dependencies.

#2: Lack of Tools
Complex and hard to understand current code base needs hours of research.

Memory management and risk of extensive redesign because of paging problem.


Growing gap between generation of experienced and newcomers.
Plan significant time every sprint to **Backlog Grooming** to understand User Stories before Sprint planning.

Initial release estimates done by **T-shirt sizes**.

**Story points** used for Sprint plan when team already understand the scope.

#3: Estimates
User Stories are often very intangible for the team. Hard to match solution to business case. Customers don't understand the environmental specifics such as lower flexibility as an exchange of high reliability. Reluctant to adopt new releases. Every minute of system downtime cost millions of dollars.
In addition to the Product Owner role, we must create a Product Owner Proxy role.

We found out the best practice is:

Every year new release to testing environment.
Every 4 months create PSI to get fast feedback.
Deliver final production releases every 1-3 years.
Extremely slow learning. 3-5 years to learn basics of mainframe development and administration, in five years of intensive work still junior.

Original generation who started to design mainframes is slowly retiring.

Universities are rarely teaching mainframes. The community is small, problems are unique. The given solutions are usually not applicable.

#5: Team
Learn as a team. Focus on experience sharing. Fast. Connect team to Product Owners and customers. Make sure they are in daily contact with business through Product Owner Proxy. Engage team in finding solution to solve their unique problems. Do retrospectives.
Result

Significant improvement in team learning and experience sharing area. We setup teams 30% faster now.

Team health improved.

We have high quality as before, but we are fixing bugs earlier.

Customer satisfaction improved a lot.

The amount of functionality remains same.

We improved testing a bit, automated some tests and addressed the missing testing strategy issue.
Summary

Agile is *flexible enough* to embrace even mainframe environment. Agile adoption was beneficial to both *customers and teams*.

Build good team, rely on experienced engineers more. Tailor the process and practices. Use *pair programming*. Build on *retrospective*. Connect business through strong *Product Owner Proxy* role.
Thanks to

http://www.youtube.com/watch?v=tu8mDGb2TQ8
http://www.frs.uconn.edu/focus/MENU/running.html
http://mainframesvista.blogspot.com/
http://www.les-smith.com/software/assembler/independent-code.htm

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