Quality in 2011: A Survey of the State of the Art

by: Capers Jones

Tuesday July 26, 2011

Software quality is a topic of importance throughout the world. Unfortunately software quality assurance groups are often understaffed for the work at hand, and also undercapitalized and under equipped. This presentation attempts to cover the known factors which influence software quality results, including methodologies, tools, and staffing levels. The presentation provides empirical data on the impact of major quality approaches, such as the six-sigma approach, TSO/TSP, clean-room methods, ISO certification, the Software Engineering Institute (SEI) capability (CMM) level concept, and other topics that can impact overall quality levels by as much as 1%. The presentation utilizes the function point metric for quantifying quality results. U.S. software averages about 5 defects per function point, with about 85% of these being removed prior to delivery. Empirical data is provided on software quality levels in a number of industries, and in the major industrialized countries.

This presentation will explain the measured impact of poor quality on the software industry, the state of the art of defect prevention and removal, the value of achieving > 95% defect removal efficiency, and the return on investment of successful quality control.

Capers Jones is currently the President and CEO of Capers Jones & Associates LLC. He is also the founder and former chairman of Software Productivity Research LLC (SPR). He holds the title of Chief Scientist Emeritus at SPR. Capers Jones founded SPR in 1984. Before founding SPR Capers was Assistant Director of Programming Technology for the ITT Corporation at the Programming Technology Center in Stratford, Connecticut. He was also a manager and researcher at IBM in California. Capers is a well-known author and international public speaker. His most-recent book is The Economics of Software Quality with Jitendra Subramanyam as co-author, Addison Wesley, 2011. Capers and his colleagues have collected historical data from more than 600 corporations and more than 30 government organizations. This historical data is a key resource for judging the effectiveness of software process improvement methods. More than 13,000 projects have been reviewed. In addition to his technical books, Mr. Jones has also received recognition as an historian after the publication of The History and Future of Narragansett Bay in 2006 by Universal Publishers. Mr. Jones has consulted at more than 150 large corporations and also at a number of government organizations, including NASA, the U.S. Air Force, U.S. Navy, Internal Revenue Service, and the U.S. Courts. He has also worked with several State governments.
Tuesday July 26, 2011

6:30 PM – Networking and Pizza(*)
7:00 - 8:00 PM – Program

(*) There is no cost to attend at McLean and Silver Spring.

Locations:
Mr. Jones will be presenting remotely from his home, with video tele-conferencing (VTC) between:

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<thead>
<tr>
<th>Location</th>
<th>Room</th>
<th>Address</th>
<th>Host</th>
<th>Cell</th>
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<tbody>
<tr>
<td>MITRE-2, room 1H300</td>
<td></td>
<td>7515 Colshire Drive</td>
<td>Scott Ankrum</td>
<td>240-731-7581</td>
</tr>
<tr>
<td>McLean, VA 22102</td>
<td></td>
<td>10903 New Hampshire Ave</td>
<td>James Simpson</td>
<td>301-996-4976</td>
</tr>
<tr>
<td>MITRE, room 2503</td>
<td></td>
<td>7515 Colshire Drive</td>
<td>Richard Eng</td>
<td>703-201-9112</td>
</tr>
<tr>
<td>Eatontown, NJ 07724</td>
<td></td>
<td>10903 New Hampshire Ave</td>
<td>Tim Rice</td>
<td>978-758-2704</td>
</tr>
<tr>
<td>MITRE, room 1M306</td>
<td></td>
<td>202 Burlington Rd (Rt. 62)</td>
<td>Tim Rice</td>
<td>978-758-2704</td>
</tr>
<tr>
<td>Bedford, MA 01730</td>
<td></td>
<td>202 Burlington Rd (Rt. 62)</td>
<td>Tim Rice</td>
<td>978-758-2704</td>
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If you can host another location via VTC, please contact Scott Ankrum (below)

TO ATTEND THE MeetingPlace Collaboration CONFERENCE:

2. Click on Attend Meeting. If MeetingPlace Collaboration Window does not automatically open, press connect. 3. Dial your telephone to connect to the audio of the meeting.
   - Dial 703-983-6338 (x36338) from the Washington DC region.
   - Dial 781-271-6338 (x16338) from the Bedford, MA region.

Meeting ID: 509509, when prompted. Meeting Password: 05090509, when prompted.

Visit [http://audioconference.mitre.org](http://audioconference.mitre.org) to test your web browser for compatibility with the web conference. Follow this link to the browser test link on the page.

Registration:


You must register by noon on Monday, July 25. If you cannot attend at any location, select telephone dial-in when you register. To RSVP for FDA (Silver Spring), please indicate citizenship. If not a US citizen, please provide your title, employer, and address. Allow two business days for registration before the meeting.

For registration problems or further information contact Scott Ankrum at: ankrums@mitre.org or 703-983-6127

Software SIG Chairman: T. Scott Ankrum (ASQ & IEEE)
Software SIG Committee: Richard Eng (ASQ); Chris Jones (ASQ & SSQ); Alfred Kromholz (SSQ); Tim Rice; James M. Simpson (ASQ); Tom Starai (IEEE), Tom Neff (IEEE), Lance Kelson (SSQ & IEEE), Aaron Dagen (IEEE)

Sponsored Jointly By: The American Society for Quality (ASQ), Washington DC & Maryland Metro Section (509), Software Special Interest Group (SSIG); IEEE Computer Society, Washington, DC & Northern Virginia Chapters; and Society for Software Quality (SSQ), Washington, DC Area Chapter. Members of the ASQ SSIG include software quality professionals, software engineers, and others interested in applying quality principles to the field of software development. See our web page: [http://www.asq509.org/ht/d/sp/i/2499/pid/2499](http://www.asq509.org/ht/d/sp/i/2499/pid/2499). We meet every month, usually at the MITRE facility in Tyson’s Corner, Virginia, with VTC to other locations.

Next Month: ‘Knowledge Management’ by Sam Chance, on Tuesday, August 23, 2011
Directions to the MITRE-1 Facility in McLean, Virginia:
Take the Beltway, I-495 to Virginia. Take Exit 46B (McLean, Route 123). Take Route 123 North, (also called Dolley Madison Blvd.) and go to the second traffic light at Colshire Drive. Turn right on Colshire Drive and continue through circle on Colshire. **Park in front of or to the right of the buildings, before passing the gate. (The gates are closed at 7:00).** Additional directions can be found at: [http://www.mitre.org/about/locations/va_mclean_mitre2.html](http://www.mitre.org/about/locations/va_mclean_mitre2.html)

The MITRE-1 building is at the top of Colshire Drive, directly in front of you.
Directions to the FDA facility in Silver Spring, MD:

From the Capital Beltway, I-495, take New Hampshire Ave, Rt 650 north to Michelson Rd.

From Columbia Pike, Rt 29, take New Hampshire Ave, Rt 650 south to Michelson Rd.

From the Capital Beltway, I-495, take New Hampshire Ave, Rt 650 north to Michelson Rd.

From Columbia Pike, Rt 29, take New Hampshire Ave, Rt 650 south to Michelson Rd.

White Oak Building 66 (circled), room G512. This is a large conference room just beyond the Security desk on the right side of the grand atrium.

After 6 PM, visitors may use the surface parking closest to the building 66 entrance which are reserved for commuters with car pools. The north east parking garage is also an option.
Directions to the MITRE Facility in Eatontown, New Jersey:

From the New Jersey Turnpike: If traveling from the SOUTH, get off the Turnpike at Exit 7A (195 toward Shore Points). Take 195 East towards the ocean and shortly after 195 turns into Route 138 (approximately 35 miles) watch for Route 18 North (Eatontown). Take Route 18 North to Exit 13A (Wayside West/Wyckoff Road). At end of ramp, bear left. At first traffic light (Hope Road) make a left turn. Make second left turn onto Industrial Way. The MITRE Corporation is next to the First Atlantic Credit Union on the left hand side of Industrial Way. There is a MITRE sign out front. There are two buildings on the left side of Industrial Way. The first building is MITRE, the second building is TYCO. Take a left turn into the parking lot of the first building, which is MITRE.

If traveling from the NORTH, get off the Turnpike at Exit 11 (Garden State parkway exit). Follow the Garden State Parkway until Exit 105 (Eatontown). Follow the directions from the Garden State Parkway below.

From the Garden State Parkway: Follow the Garden State Parkway from the North or from the South to Exit 105 (the exit numbers increase going from south to north). After paying the toll at Exit 105, make first right turn onto Hope Road. Follow Hope Road to Industrial Way (second left turn after crossing Wyckoff/Shafto Road). Make second left turn onto Industrial Way. The MITRE Corporation is next to the First Atlantic Credit Union on the left hand side of Industrial Way. There is a MITRE sign out front. There are two white buildings on the left side of Industrial Way. The first building is MITRE, the second building is TYCO. Take a left turn into the parking lot of the first building, which is MITRE.

When you are facing the front of the MITRE building, the entrance to the ASQ meeting will be from the left parking lot opposite First Atlantic bank. Follow the signs to the conference room.
Directions to the MITRE complex in Bedford, Massachusetts:

From New Hampshire to MITRE Complex:
Take Route 3 South to Exit 26 (Route 62)
Turn Left on Route 62. It is a short distance to the MITRE entrance on left--watch for building directories on MITRE grounds

From Manchester Airport (NH) to MITRE Complex:
Start out going West on Airport Rd. toward parking
Turn slight right onto Brown Ave/NH-3A
Merge onto NH-101 West via the ramp on the left toward Bedford/Nashua
Take the Everett Turnpike South exit toward Merrimack/Nashua
Merge onto Everett Turnpike (toll road)
Everett Turnpike becomes US-3 South
Take exit 26 (Route 62) toward Bedford/Burlington
Turn Left onto (Route 62) Burlington Road
At second set of traffic lights, turn left at MITRE Bedford Campus entrance--watch for building directories on MITRE grounds.

Logan Airport to MITRE Complex:
Exit airport towards Route 1A South/Sumner Tunnel (I-93) Boston.
Proceed through tunnel towards Storrow Drive (I-93 North).
Take I-93 North eleven miles to Exit 37B (Route 128 (I-95) South).
Take Route 128 (I-95) South six miles to Exit 32A.
Take Exit 32A, and proceed on Route 3 North.
Take Route 3 North for two miles to Exit 26 (Route 62).
Bear right on Route 62.
Take Route 62 a short distance to the MITRE Bedford Campus entrance on left--watch for building directories on MITRE grounds.