CSA Revolution Series: Computer Software Assurance

DIRECT FROM THE SOURCE – HEAR FROM THE
FDA – INDUSTRY CSA TEAM

(FICSA Team)

Gilead CSA Journey
Live Webinar Series, Episode 2
Thursday July 9th, 2020

Khaled Moussally (Host)
EVP, Clients & Regulatory Relations

Ken Shimamoto (Guest)
Sr Director, IT

Senthil Gurumoorthi (Guest)
Director, IT
Agenda

- Hear direct from the Source “FDA-Industry CSA Team” (FICSA) Members!
- 2020 Webinar Series Schedule
- Gilead CSA Challenge and Success

Objectives

- Don’t wait for the FDA Draft Guidance to be released
  - Start thinking how you want to implement CSA
  - Pilot Studies Effective
  - Digitize your current paper CSA processes
- Create awareness to accelerate innovation
- Inspire action so you can begin to realize value
Ken Shitamoto
SR. DIRECTOR, IT

Ken leads the IT quality engineering function at Gilead Sciences, which performs software quality assurance (testing), validation, and infrastructure qualification. He is a multi-disciplined professional with extensive experience in quality engineering, quality management, project management, and software development. He has been in the biopharmaceutical space since 1993 and has worked both on the manufacturer, vendor, and consulting sides of the business. Additionally, he has also performed over 100 GXP computer systems compliance audits globally. He holds a BA Molecular Cell Biology and MS Computer Science and from UC Berkeley and San Jose State University respectively. He is an avid supporter of the American Lung Association, and Ken and his daughter have raised over 130K dollars to fight lung disease.

Senthil Gurumoorthi
DIRECTOR, IT

Senthil leads IT Quality Assurance function at Gilead Sciences, which provides independent oversight for GxP IT Infrastructure, Applications & Platforms and manages Vendor Oversight, IT Inspection and audit readiness programs. He has over 17 years of diverse experience in biopharmaceutical business ranging from pre-clinical, R&D to manufacturing with leadership expertise on Quality Assurance, Risk Management, Inspection/Audit Management, and Vendor Management. Additionally, as certified Auditor conducted ISO and Part 11/Annex 11 Audits globally. He holds B.E in Electronics & Communication from PSG College of Technology, MS in Electrical Engineering from New Jersey Institute of Technology and Masters in Business Administration (MBA) from Imperial College London.

Khaled Moussally
EXECUTIVE VICE PRESIDENT CLIENTS & REGULATORY RELATIONS

Khaled is a Quality & Compliance executive and a thought leader providing cutting-edge solutions to Life Sciences industry. After spending over 25+ years with corporate in IT, Manufacturing and Quality, Khaled transitioned into consulting to bring about a paradigm shift in Quality & Compliance by leveraging his experience with regulatory agencies. Khaled is a key participant of the MDIC “Case for Quality Initiatives” and a member of the “FDA – Industry CSA team” contributing to the FDA draft guidance “Computer Software Assurance (CSA) for Manufacturing, Operations, and Quality System Software”. Khaled is on the “ISPE GAMP America Steering Committee” and has co-presented with the FDA in numerous industry conferences on how to reduce CSV cycle times while enhancing quality by applying CSA concept.
## FDA - Industry CSA (FICSA) Webinar’s Schedule

<table>
<thead>
<tr>
<th>Company</th>
<th>Date</th>
<th>Episode#</th>
<th>Topic /Guest(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnson &amp; Johnson</td>
<td>July 23rd</td>
<td>3</td>
<td>Open discussion with Ron Schardong and Melissa Vazquez - walking through a J&amp;J’s CSA case study for MES</td>
</tr>
<tr>
<td>Fresenius</td>
<td>August 6th</td>
<td>4</td>
<td>Open discussion with Bill D’Innocenzo walking through a Fresenius CSA journey</td>
</tr>
<tr>
<td>Medtronic</td>
<td>August 20th</td>
<td>5</td>
<td>Open discussion with Francesca Bill - walking through a Medtronic CSA Case Study Automating Risk Based</td>
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<tr>
<td>Boston Scientific</td>
<td>September 3rd</td>
<td>6</td>
<td>Open discussion with Ray Murphy &amp; Damien McPhillips - walking through a Boston Scientific CSA Case Study for PM/Calibration System</td>
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<tr>
<td>TBD</td>
<td>September 17th</td>
<td>7</td>
<td>TBD</td>
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<td>TBD</td>
<td>October 01st</td>
<td>8</td>
<td>TBD</td>
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<tr>
<td>TBD</td>
<td>October 15th</td>
<td>9</td>
<td>TBD</td>
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<tr>
<td>TBD</td>
<td>October 29th</td>
<td>10</td>
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Register for Episode 3 - July 23rd
FDA - Industry CSA (FICSA) Team Members

CSA Revolution Series
Game Changer Kick Off
Episode 1
Was back on April 23rd, 2020

• Recorded Webinar - CSA Game Changer Webinar with the Cisco Vicenty from FDA Click Here

• Webinar Material - Click Here

• CG/ CSA White Paper -

Panelists

Cisco Vicenty is currently the Program Manager for the Center for Quality & Compliance, within the Office of Compliance, Center for Devices and Radiological Health (CDRH), FDA. He offers a broad range of experience in various roles within the CDRH overseeing various programs such as the Center for Devices and Radiological Health (CDRH) and the Office of Compliance. He has been involved in and has worked on numerous projects, policies, and initiatives related to device compliance and quality assurance.

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## FDA - Industry CSA Team (FICSA)

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<tr>
<td>Baxter Healthcare</td>
<td>Tina Koepke</td>
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<tr>
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<td>Damien McPhillips</td>
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<td>Ray Murphy</td>
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<td>Compliance Group</td>
<td>Khaled Moussally</td>
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<td>Edwards Lifesciences</td>
<td>Andy Lee</td>
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<td>FDA</td>
<td>Cisco Vicenty</td>
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<td>Fresenius Medical Care</td>
<td>Bill D'Innocenzo</td>
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<td>Lou Poirier</td>
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<td>Medtronic</td>
<td>Frankie Bill</td>
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<tr>
<td>Medtronic</td>
<td>Michael Branch</td>
</tr>
<tr>
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<td>April Francis</td>
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<tr>
<td>NeuroVision Imaging</td>
<td>Pepe Davis</td>
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<td>Ortho-Clinical Diagnostics</td>
<td>Des Chesterfield</td>
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<tr>
<td>Siemens Digital Industries</td>
<td>Jason Spiegler</td>
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<td>Greg Robino</td>
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<tr>
<td>Roche</td>
<td>Thorsten Ruehl</td>
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<tr>
<td>Omnicell</td>
<td>Frank Meledandri Sr.</td>
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</tbody>
</table>

Join FICSA LinkedIn Group

Contributions also provided by past team members:
Stacey Allen, Jason Aurich, Sean Benedik, Laura Clayton, Bill Hargrave, Joe Hens, Scott Moeller, John Murray, Penny Sangkhavichith, and Dana Guarnaccia
Cultural Barriers Paralyzing Industry

Summary of Impact

• Manufacturers are reluctant to invest
• When they invest, the documentation burden is excessive (not commensurate with Risk) impacting “Time to Value”
• Cybersecurity (Enterprise) risk increases
• Slow to upgrade/ implement patches due to “revalidation” lifecycle burden
• Impacts all Centers across FDA!

For software not used in product, manufacturers refer to significantly more burdensome guidance (20+ years old), based on Fear of a 483s, based on prior FDA Investigations and 3rd Party Consultants.

“We are risk-based... everything is high risk!”

“We validate all Software... like product Software!”

“Too much documentation – lot of overhead for little value!”

“Most deviations are documentation errors, not Software bugs - we trip over ourselves!”

“It took 4x longer for CSV than the actual analysis!”

“What if analysis not practical to maintain”

“Data mining? We looked at purchasing an inexpensive BI tool, but CSV cost was too high.”

“The real pain no one discusses, is the CSV burden over the lifecycle of maintaining software.”
Computer Software Assurance

Five Things You Need To Know

Computer Software Assurance (CSA) comes from a multi-year collaboration between FDA and industry. It identifies common pain points; FDA’s current thinking puts patient safety and product quality at the heart of the risk assessment process.

1. Risk is based on the impact to patient safety and product quality measured against requirement complexity.
2. It calls for the least burdensome documentation approach.
3. It reduces paperwork by 80% with unscripted and ad-hoc testing.
4. It results in less issues encountered in Production.
5. FDA & ISPE supported.

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A Paradigm Shift
Channelling John Murray

Benefit of detecting patient risk areas using a more flexible, less burdensome, and faster approach for data mining far exceeds the documentation/time burden of current expectations.

From CSV...
- Focus on creating documentary records for compliance
- “Validate” everything (and miss higher risk areas)
- Ignoring previous assurance activity or related risk controls

To CSA...
- Focus on testing for higher confidence in system performance
- Risk based “Assurance”, applying the right level of rigor for a given level of risk to patient safety and/or product quality
- “Take credit” for prior assurance activity and upstream/downstream risk controls
Objectives

❑ Don’t wait for the FDA Draft Guidance to be released
  ➢ Start thinking how you want to implement CSA
  ➢ Pilot Studies Effective
  ➢ Digitize your current paper CSA processes (See appendix)

❑ Create awareness to accelerate innovation

❑ Inspire action so you can begin to realize value
Questions?

Contacts

Ken Shitamoto  Ken.Shitamoto@gilead.com
Senthil Gurumoorthi  Senthil.Gurumoorthi@gilead.com
Khaled Moussally -  khaled@complianceg.com
The Meat - “FDA - Industry CSA Team Recommendations”

**Note:** All of these recommendations are within FDA Regulations!
Focus on Assurance

Shift the discussion
What does FDA care about? Risk Considerations

- Direct impact to device quality and device safety that also has a direct patient safety risk
  - Directly impacts physical properties of the product or manufacturing process identified as essential to device safety or device quality by the manufacturer
  - Measures, inspects, analyzes, and or dispositions the product or process
  - Determines acceptability or performs process corrections without human intervention, awareness, or review
  - Directly impacts labeling, instructions for use, or direct alerts or communications to the user
  - Automates surveillance, trending, or tracking of product quality or patient safety issues identified as essential by the manufacturer
Appropriate methods and activities for software assurance

- Take a least-burdensome approach – focus on value for the Manufacturer, not the Investigator.
- Leverage existing activities and supplier data. Do not reinvent the wheel; take credit for work already done
- Leverage use of process controls to mitigate risk
- Use Computer System Validation tools to automate assurance activities
  - Scope of 21 CFR 820.70(i) is applied when computers or automated data processing systems are used as part of production or quality system.
  - FDA does not intend to review validation of support tools. Manufacturer determines assurance activity of these tools for their intended use.
  - Part 11 narrowly scoped and is under enforcement discretion apply appropriately
- Use Agile testing methods and unscripted testing as appropriate
- Use electronic data capture and record creation, as opposed to paper documentation, screen shots, etc
- Leverage continuous data and information for monitoring and assurance
## Assurance Approach

<table>
<thead>
<tr>
<th>Assurance Approach</th>
<th>Test Plan</th>
<th>Test Results</th>
<th>Record (Digital Acceptable)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unscripted Testing:</strong> Ad-hoc (with least-burdensome documentation)</td>
<td>Testing of features and functions with no test plan</td>
<td>Details regarding any failures/deviations found</td>
<td>Summary description of features and functions tested&lt;br&gt;Issues found and disposition&lt;br&gt;Conclusion statement&lt;br&gt;Record of who performed testing and date</td>
</tr>
<tr>
<td><strong>Unscripted Testing:</strong> Error guessing</td>
<td>Testing of feature and function fail-modes with no test plan</td>
<td>Details regarding any failures/deviations found</td>
<td>Summary description of fail-modes tested&lt;br&gt;Issues found and disposition&lt;br&gt;Conclusion statement&lt;br&gt;Record of who performed testing and date</td>
</tr>
<tr>
<td><strong>Unscripted Testing:</strong> Exploratory Testing</td>
<td>Establish high level test plan objectives for features and functions <em>(no step-by-step procedure is necessary)</em></td>
<td>Pass/fail for each test plan objective&lt;br&gt;Details regarding any failures/deviations found</td>
<td>Summary description of features and functions tested&lt;br&gt;Result for each test plan objective – only indication of pass/fail&lt;br&gt;Issues found and disposition&lt;br&gt;Conclusion statement&lt;br&gt;Record of who performed testing and date</td>
</tr>
<tr>
<td><strong>Scripted Testing:</strong> Limited</td>
<td>Limited Test cases (step-by-step procedure) identified&lt;br&gt;Expected results for the test cases&lt;br&gt;Identify unscripted testing applied&lt;br&gt;Independent review and approval of test plan.</td>
<td>Pass/fail for test case identified&lt;br&gt;Details regarding any failures/deviations found and disposition regarding fails</td>
<td>Summary description of features and functions tested&lt;br&gt;Result for each test case - only indication of pass/fail&lt;br&gt;Issues found and disposition&lt;br&gt;Conclusion statement&lt;br&gt;Record of who performed testing and date&lt;br&gt;Signature and date of appropriate signatory authority</td>
</tr>
<tr>
<td><strong>Scripted Testing:</strong> Robust</td>
<td>Test objectives&lt;br&gt;Test cases (step-by-step procedure)&lt;br&gt;Expected results&lt;br&gt;Independent review and approval of test cases.</td>
<td>Pass/fail for test case&lt;br&gt;Details regarding any failures/deviations found and disposition regarding fails</td>
<td>Detailed report of assurance activity&lt;br&gt;Result for each test case - only indication of pass/fail&lt;br&gt;Issues found and disposition&lt;br&gt;Conclusion statement&lt;br&gt;Record of who performed testing and date&lt;br&gt;Signature and date of appropriate signatory authority</td>
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Unscripted Testing:
- **Ad-hoc** (with least-burdensome documentation)
- **Error guessing**
- **Exploratory Testing**

Scripted Testing:
- **Limited**
- **Robust**
PAPERLESS VALIDATION TOOL
Polarion CSA Package

- Shorter Cycle Times
- CSA Methodology

- Compliant

- Paperless / Contactless
- Siemens Polarion

Industry Leading ALM

Siemens Polarion CSA Template

- Ready to deploy
- Zero footprint
- 100% paperless CSA
Key Lesson #2—
No better time to go paperless/contact-less

“Siemens Polarion is a state of the art ERES compliant paperless / contact-less validation system which has a CSA workflow and templates built in.”

- Low cost
- Zero foot print
- 100% paperless CSA
No Of User Requirements In Each Risk Rating

*Info: Pie Chart shows total number of user requirements per Risk Rating*
[User Requirements that are in Draft, Approval, Approved and Obsolete status]

User Requirement / Risk Rating

- Risk Rating - 5
- Risk Rating - 4
- Risk Rating - 3
- Risk Rating - 2
- Risk Rating - 1

Test Run Summary

- 2 Test Runs Executed
  - 0 Open
  - 0 In Progress
  - 0 Reopened
  - 1 Passed
  - 1 Failed

- 20 Issues Reported
  - 0 Resolved
  - 15 Passed
  - 20 Failed

- 35 Executed Test Cases
  - 0 Blocked

Defects Trends (30 days)
# Risk-Based Test Strategy Report

<table>
<thead>
<tr>
<th>ID</th>
<th>User Requirement</th>
<th>Risk Rating</th>
<th>Testing Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM-1375</td>
<td>UUR-01: Electrical Power voltage of 120VAC</td>
<td>3</td>
<td>Unscripted Testing - Error Guessing</td>
</tr>
<tr>
<td>RAM-1373</td>
<td>UDR-01: Equipment shall come with a manufacturer’s manual.</td>
<td>5</td>
<td>Robust Scripted Testing</td>
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<tr>
<td>RAM-1369</td>
<td>UEO-02: System shall perform to meet cleanroom environment requirements. (Equipment Operational Requirements)</td>
<td>5</td>
<td>Robust Scripted Testing</td>
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<tr>
<td>RAM-1368</td>
<td>UEO-01: System shall draw air into the Portable Hood System</td>
<td>2</td>
<td>Unscripted Testing - Exploratory</td>
</tr>
<tr>
<td>RAM-1366</td>
<td>USR-01: General Safety Requirements are not needed for this equipment</td>
<td>2</td>
<td>Unscripted Testing - Exploratory</td>
</tr>
<tr>
<td>RAM-1364</td>
<td>UGD-01: System shall have adjustable wing flaps.</td>
<td>3</td>
<td>Unscripted Testing - Error Guessing</td>
</tr>
<tr>
<td>RAM-1362</td>
<td>UGR-01: System shall have filters.</td>
<td>1</td>
<td>Vendor Audit and Assurance</td>
</tr>
</tbody>
</table>

## Defects by Status

- In Approval: 7
- Approved: 7
- Rejected: 2
- Complete: 3

## Requirements Status Report

- Info: Displays Work items filtered by Work Item type and grouped by Status.

## Change Type Report

- Change Request by Change Type
  - Data Change
  - Bug Fix
  - System Change

## Change Severity Report

- Change Request by Change Severity
  - Major
  - Medium
  - Minor