DevOps: Left Shift Education Practices

Lynn Robert Carter
Nithyanandam “Mathi” Mathiyazhagan
Mark Underwood
Ruth Lennon
Who we are: Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the IEEE P2675 DevOps Standard Committee, current or past employers of this team.

Examples or use cases presented herein are illustrative only.
<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Duration</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welcome, Introduction</td>
<td>10 minutes</td>
<td>Ruth Lennon, Letterkenny Institute of Technology</td>
</tr>
<tr>
<td>2</td>
<td>Interactive session with Q&amp;A:</td>
<td>20 minutes</td>
<td>Lynn Robert Carter, Carter Radley &amp; Mark A. Underwood, Synchrony</td>
</tr>
<tr>
<td></td>
<td>● DevOps Culture &amp; Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● DevOps Culture &amp; Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Joining the two (Break-out Session)</td>
<td>10 minutes</td>
<td>Ruth &amp; All</td>
</tr>
<tr>
<td>5</td>
<td>IEEE DevOps P2675 Standard</td>
<td>20 minutes</td>
<td>Ruth, Mark, Lynn, Mathi</td>
</tr>
<tr>
<td>6</td>
<td>Knowledge Management for DevOps</td>
<td>20 minutes</td>
<td>Nithyanandam (Mathi) Mathiyazhagan, Business and Technology Consultant</td>
</tr>
<tr>
<td></td>
<td>Interactive session with Q&amp;A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Wrap-Up</td>
<td>10 minutes</td>
<td>Ruth</td>
</tr>
</tbody>
</table>
Lynn Robert Carter

• Founding Partner, Carter Radley LLC, United States
• Professor at MSIT, Gachibowli, Hyderabad, India
• Professor Emeritus at Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, India
• Member of IEEE P2675 DevOps Standard Development Group and Secretary
• I am interested in supporting the discipline of software engineering
• I have 47+ years of experience in academia & industry
  • 17 Years at Tektronix, Motorola, GenRad, and EdgeCore Technology
  • 23 Years at Carnegie Mellon University (SEI: Senior MTS; Associate Teaching Professor)
  • CSAB and ABET/CAC Evaluator, Team Leader, Commissioner, ExCom
  • IFIP WG 2.4 Member, Officer, Emeritus

• Email: LynnRobertCarter@gmail.com
Nithyanandam “Mathi” Mathiyazhagan

- Business and Technology consultant with extensive experience in organizational transformation initiatives
- Develop product roadmap and deliver solutions that creates business value
- Conduct technical due-diligence for mergers & acquisitions
- Nurture and develop talent for the new way of working
- Lead multi-year transformational programs to achieve organizational outcomes
- Member of IEEE P2675 DevOps Standard Development Group
- Chair for the Association for Information Science and Systems – Special interest group on Knowledge Management (ASIST.ORG SIG-KM)

Email: nmathiyazhagan@live.com
Mark Underwood

- AVP, InfoSec Strategic Initiatives Advisor at Synchrony.
- Member of IEEE P2675 DevOps Standard Development Group
- Interests include
  - Big Data security & privacy,
  - Ontologies for model-based software engineering,
  - DevOps for Ops and domain-specific frameworks.
- He plays electric violin.
- Views expressed are his alone, not Synchrony.

Email: dark@computer.org
Ruth G. Lennon

- Lecturer in Letterkenny Institute of Technology, Ireland
- Member of IEEE P2675 DevOps Standard Development Group
- I am interested in supporting the ‘Ops’ side of DevOps
  - We need each other!
  - Industry needs courses that include an awareness of many aspects of a product life cycle
- I have 20+ years of experience in industry & academia
  - Lecture on courses developed specifically for industry
  - ISO/NSAI WG 38 Committee
  - ACM-W Europe Executive
  - IEEE UK&I W Committee
  - +Anything else I get talked into...

- Email: Ruth.Lennon@lyit.ie
DevOps Culture & Work

- DevOps culture is the shared norms and beliefs in terms of how we work and make decisions.
- Left Shift requires an understanding of the broader skills needed in DevOps.
- Knowledge on how to identify what is important to learn.
- We need to encourage learners to examine their beliefs in how they carry out tasks.
- Decision making is key at all levels.
- Responsibility of identification of key knowledge areas.
- Task level vs. Solution level vs. Holistic approach.
I know it all...

• All key players in all aspects must collaborate with and effectively work with one another
• This is really hard - On-boarding, career development, and staying current has been traditionally performed by a hierarchy of professionals within stove piped disciplines.
• No one can know everything.
• Collaboration requires the ability to help develop diverse members of the team to know enough to be able to collaborate
DevOps Culture & Education

• Types of knowledge including:
  • Just-In-Time micro-learning
  • Formal learning process
  • Automated collection of knowledge assets

• Continuous learning, (DevOps)
  • Continuous Professional Development (CPD)
  • Culture of freshness of knowledge assets
  • Troubleshooting/problem solving

• Validation
  • Evaluative assessment in real world scenario
  • Justification/Rationale
  • Application of knowledge
Why Micro-learning?

• Timeframe precludes traditional classroom settings
• Dominated by close collaboration with domain experts
• No time for IT specialists to learn other domains
• Many small steps vs. broad sweep of architecture
Use Case: Challenges

- Your CI/CD pipeline includes new partners.
- How will you update your CI/CD to accommodate new players?
- How will you communicate your practices to new partners?
- How will you assess competency of specific individuals to contribute to a build?
  - To maintain and patch?
  - To deploy builds?
- Use Case: Emergency Medical Systems (EMS)
Break Out

Break out into groups to talk about:

• DevOps & Work (Group 1)
• DevOps & Culture (Group 2)
DevOps Culture & Work: Outcomes

• What is culture?
• Can we change culture?
• Knowledge on how to identify what is important to learn
• Learning on the job, can any course survive without it?
• Experiential learning. What qualifies?
• Who cares if you have formal qualifications anyway?
P2675 - DevOps

- DevOps - Standard for Building Reliable and Secure Systems Including Application Build, Package and Deployment
  - [https://standards.ieee.org/project/2675.html](https://standards.ieee.org/project/2675.html)
- This standard will specify practices for groups including development, operations and other key stakeholders to collaborate and communicate effectively to build, package and deploy software and systems in a secure and reliable way.
- All of these activities and functions shall be integrated within the complete lifecycle.
What topics might a good standard include?

- Software Systems
- Organization
- Process
- Lifecycle
  - Agreement, acquisition, supply
  - Portfolio management
  - HR/Talent management
  - Quality management
  - Technical process: decision management; risk management
- Business analysis
  - Stakeholders, systems requirements, software requirements
  - Architecture, design, interaction, V&V
  - Operations, maintenance, disposal
Other embedded issues, what are your priorities?

• Security
• Performance
• Assurance
• Legal & Regulatory
• Ethical
• Auditing
Knowledge Management for DevOps

- Existing knowledge management practices
- Why DevOps is a change?
- A number of different types of knowledge including Just-In-Time micro-learning and formal learning process
- Validated learning of core competencies
  - Bite size learning objects to build a learning portfolio
Standards for Knowledge Management

- A new standard for knowledge management
  - ISO 30401
- “A human or organizational asset enabling good decisions and effective action in context.”
- Examples of Knowledge:
  - insights,
  - know-hows
- What other dimensions for knowledge are there?
Break Out

Break out to talk about:

• Standards for Knowledge Management
• Standards issues previously mentioned
Workshop Outputs
Knowledge Management Best Practices

- Identify knowledge types
  - Know-what, Know-how, Know-why, and so on
  - Identify the knowledge receivers, and their needs
  - Develop knowledge processes (use case) integrating knowledge types suited for the users (automate as much as you can)

- Integrate knowledge processes as a part of the daily routine
Take Away/Concluding Remarks

- Lynn
- Mathi
- Ruth

- Watch out for the new standard:
- P2675 - DevOps - Standard for Building Reliable and Secure Systems Including Application Build, Package and Deployment
- https://standards.ieee.org/project/2675.html