Defining Leadership and its Challenges while Transitioning to DevOps

Krikor Maroukian, Microsoft, Culture and Cloud Experience, Greece
Email: krmaro@microsoft.com

Assoc. Prof. Stephen R. Gulliver, Henley Business School, UK
Email: s.r.gulliver@henley.ac.uk

15th International Conference on Software Engineering Advances
October 18th - 22nd, 2020
Authors

Krikor Maroukian gained a BSc. (Hons) degree in Computer Science and an MSc. in Applied Informatics in 2005 and 2006 respectively. Currently, he works as a Sr Modern Service Management consultant at Microsoft Greece. He is also the International Representative of the IT Service Management Forum (itSMF Hellas) and member of the Board of British Computer Society (BCS), The Chartered Institute for IT, Hellenic Section. Krikor is a PhD Cand. at Henley Business School, University of Reading, UK. Krikor’s interest lie in the areas of service management, agile software development, lean product development, DevOps adoption.

Stephen R. Gulliver received a BEng. (Hons) degree in Microelectronics, an MSc. degree (Distributed Information Systems) and a PhD in 1999, 2001, and 2004 respectively. Stephen worked within the Human Factors Integration Defence Technology Centre (HFI DTC), before getting a job as a lecturer at Brunel University (2005-2008). Dr Gulliver joined Henley Business School (University of Reading) in 2008 as a lecturer and in 2014 was promoted to the role of Associate Professor. Since 2005 Dr Gulliver’s teaching and research (in the UK and abroad) has linked to the area of pervasive Informatics, and he has interests including: multimedia and information assimilation, e-learning and education systems, usability and human factors, technology acceptance, persuasion systems, health systems, and systems conflict and failure.
Agenda

- Motivation & Background
- Research Questions
- Results Analysis and Evaluation
  - Interviews
  - Survey
- Future Research
Motivation and Background
Working in a “silo” mindset

There is no problem with my code, you’re either deploying wrong or there is a problem with your infrastructure.

Infrastructure looks good, must be a code problem.
Defining DevOps is a Three-way Construct

1. People
2. Practice
3. Products

DevOps
Lean IT
Agile
ITSM

Where business comes to life
<table>
<thead>
<tr>
<th>Academic Publication</th>
<th>Definition of DevOps</th>
<th>Focus on Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bass et al. 2015</td>
<td>DevOps is a set of practices intended to reduce the time between committing a change to a system and the change being placed into normal production while ensuring high quality</td>
<td>Goal-oriented (fast delivery of quality software)</td>
</tr>
<tr>
<td>Dyck et al. 2015</td>
<td>DevOps is an organisational approach that stresses empathy and cross-functional collaboration within and between teams – especially development and IT operations – in software development organisations, in order to operate resilient systems and accelerate the delivery of changes</td>
<td>Means-oriented (empathy, cross-functional collaboration); and goal-oriented (operate resilient systems, accelerate change delivery)</td>
</tr>
<tr>
<td>Penners &amp; Dyck 2015</td>
<td>DevOps is a mindset, encouraging cross-functional collaboration between teams – especially development and IT operations – within a software development organisation, in order to operate resilient systems and accelerate the delivery of changes</td>
<td>Means-oriented (attitude, cross-functional collaboration)</td>
</tr>
<tr>
<td>Smeds et al. 2015</td>
<td>A set of engineering process capabilities supported by certain cultural and technological enablers</td>
<td>Means-oriented (engineering capabilities)</td>
</tr>
<tr>
<td>De Franca et al. 2016</td>
<td>DevOps is a neologism, representing a movement of ICT professionals addressing a different attitude regarding software delivery through the collaboration between software systems development and operations functions, based on a set of principles and practices, such as culture, automation, measurement and sharing’</td>
<td>Means-oriented (attitude, cross-functional collaboration)</td>
</tr>
<tr>
<td>Jabbari et al. 2016</td>
<td>DevOps is a development methodology aimed at bridging the gap between Development and Operations, emphasising communication and collaboration, continuous integration, quality assurance and delivery with automated deployment, utilising a set of development practices</td>
<td>Means-oriented (cross-functional collaboration, automated deployment)</td>
</tr>
<tr>
<td>Lwakatare et al. 2016</td>
<td>DevOps is a mindset substantiated with a set of practices to encourage cross-functional collaboration between teams, especially development and IT operations, within a software development organization, in order to operate resilient systems and accelerate delivery of change.</td>
<td>Means-oriented (cross-functional collaboration, resilient systems, accelerated deployment)</td>
</tr>
</tbody>
</table>
Research Questions
Research Questions

RQ1) Which leadership characteristics required to enable DevOps practice and principle adoption?

RQ2) What are the DevOps adoption inhibitors (resistance factors)?

RQ3) How should DevOps leadership be measured?
Research Design
Research
Study
Design
Interview Evaluation
Interview Series (Sep. 2018 - Jan 2019)

No. of Interview Participants per Country

- Greece: 11
- UK: 10
- Saudi Arabia: 2
- Czech Republic: 1
- Estonia: 1
- Georgia: 1
- Italy: 1
- Netherlands: 1
- South Africa: 1
- UAE: 1
Interview Series (Sep. 2018 - Jan 2019)

- Interviewee working industry included Consulting Services (14), Aviation (3), Government (3), Lottery (2), Insurance (2), Finance (2), Manufacturing (1), Logistics (1), ISV (1), Automotive (1)

Graph: Has your organisation adopted any of the following frameworks or practices?

- Structured Service Management Approach (14)
- Structured Project Management Approach (12)
- Agile Software Development (14)
- Lean IT (6)
- DevOps (10)
- Other (9)

Legend: Customer: Consultant
Structured, agile and lean practices in order of preference (30 interviews)

- SCRUM
- Kanban
- Continuous delivery
- Continuous integration
- Value Stream Map
- Pair programming
- Lean management
- Kaizen
- Lean leadership
- Gemba
- CMMI-DEV
- Customer presence product development
- Lean process management
- XP
- TDD/TFD
- Agile Unified Process
- Tacit knowledge value
- Water-Scrum-fall
- Lean failure
- RUP
- 5S
- CAS Theory
- R&D outsourcing
- Systems Thinking
- Lean Six Sigma
- Teams Co-location
- Complexity Theory
- Knowledge Centred System
- XP
- TDD/TFD
- Agile Unified Process
- Tacit knowledge value
- Water-Scrum-fall
- Lean failure
- RUP
- 5S
- CAS Theory
- R&D outsourcing
- Systems Thinking
- Lean Six Sigma
- Teams Co-location
- Complexity Theory
- Knowledge Centred System
- TOGAF
- UPEDU
- Incentive contract
Structured, agile and lean principles in order of preference (30 interviews)

- Organisational Culture
- Monitoring
- Automation
- Measurement
- Employee satisfaction
- Shared Values
- Respect for people
- MTTR
- Making flow of work visible
- Knowledge sharing
- ASD
- TQM
- Employee motivation
- Employee commitment
- PDS
- Lean software development
- HumanOps
- Continuous Experimentation
- Lean Culture
- CI
- Refactoring
- Nexus
- SaFE

Where business comes to life
Participants Defining DevOps Adoption Leadership and its Challenges

P27 (Georgia, IT Operations Lead) stated:
Any change can bring resistance and hinder adoption practices. Moving away from any already established approach generates resistance.

P7 (UAE, Senior Digital Transformation Technologist) mentioned that:
Blame ‘game’ exists between IT teams which breeds increased blameful culture.

P19 (Greece, IT Operations Manager) stated that:
Leadership is the most important thing to adoption barrier breakdown.

P24 (Greece, CIO) adds that:
Resistance happens because all the teams are getting out of their comfort zone. We are talking about different methodology, different structure, different KPIs, different roles, different rewarding scheme, different working location since the team is now collocated - everything is different.

P18 (UK, Managing Director) argued that:
Rather than adopting every new framework, methodology, set of practices, organizations should look into identifying the current bottlenecks and improvement areas.

P23 (Estonia, CDO) added that:
A cross-functional leadership role with end-to-end ownership of DevOps adoption is imperative.
Organisational teams as part of DevOps adoption

- IT DEVELOPMENT: 29
- IT OPERATIONS: 29
- INFORMATION SECURITY: 24
- QUALITY ASSURANCE: 28
- AUDIT AND COMPLIANCE: 21
- BOARD OF DIRECTORS: 22
- MARKETING: 18
- FINANCE: 17
- PROCUREMENT: 19
- SALES: 18
- HUMAN RESOURCES: 22
- LEGAL: 9
- EXTERNAL SERVICE PROVIDER: 17
DevOps Adoption Leadership
Top 5 identified factors (30 interviews)

- Technical Background: 16
- Communication and Collaboration Skills: 14
- Negotiation Skills: 15
- Previous experience on transformation: 14
- Holistic Systems Thinking: 8
Survey Evaluation
Online Survey (Aug 2019 – Dec 2019)

Please state your age (years) to help us improve segmentation of obtained survey outcomes.

- Less than 21: 0
- 21-30: 4
- 31-40: 55
- 41-50: 76
- 51-60: 33
- 61-70: 3
- 71+: 0

Please state your role area within the organization you are currently employed? Please select only one option.

- Audit and Compliance: 0
- Business Development: 12
- Consultant: 51
- C-Level (CIO, CTO, CDO, etc.): 31
- Information Security: 8
- Operations: 21
- PMO: 22
- Product/Software Development: 19
- Quality Assurance: 0
- Other: 7

How many years of professional experience do you have?

- less than 2: 0
- 2-5: 4
- 6-10: 3
- 11-15: 42
- 16-20: 47
- 21+: 75

Which region are you based in? Please select only one option.

- Africa: 0
- Asia: 2
- Australia and New Zealand: 3
- Europe: 119
- Middle East: 34
- North America: 13
- Russia: 0
- South America: 0
Survey Participant Job Role

- Deputy Manager
- IT Manager
- Database administration
- IT Service Management
- Head of Legal Department
- Head of Infrastructure
- Director
- Information Security
- Business Development
- IT Architect
- PMO
- Operations
- C-Level (CIO, CTO, CDO, etc.)
- Product/Software Development
- Consultant
Participant Organisation on DevOps Adoption Planning

- Plan to adopt in the future: 35%
- Adopted across some parts of the IT organization: 30%
- Adopted across the IT organization: 18%
- Adopted across the enterprise: 12%
- Not adopted and no plans to adopt: 5%
Role Responsible for Decision Making Process in DevOps Adoption

- Analyst
- Team Leader
- Executive Committee
- System/Network/Database Administrator
- Developer
- DevOps Engineer
- Business Domain
- Operations Lead
- Architect
- Product Owner
- Development Lead
- C-Level (CIO, CTO, CDO, etc.)
DevOps adoption metrics in order of highest preference

- Time to Market: 145
- Critical Success Factors: 133
- Key Performance Indicators: 130
- Deployment frequency: 129
- Deployment duration (time): 124
- Time to Detect (defect): 108
- Time to Recovery: 104
- Behavioral Metrics: 102
- Feature usage: 88
Future Research
Future Research

• This study can be further enhanced in the future by focusing on insights on the influence posed on DevOps teams by the adoption leadership role due to varying cognitive load levels.

• In the current pandemic crisis, as long as the “work-from-home” paradigm is enforced, in the global software product development community, it could potentially be affecting the interplay of DevOps adoption leadership characteristics.
Thank you for your attention

Krikor Maroukian, Microsoft, Culture and Cloud Experience, Greece
Email: krmaro@microsoft.com

Assoc. Prof. Stephen R. Gulliver, Henley Business School, UK
Email: s.r.gulliver@henley.ac.uk