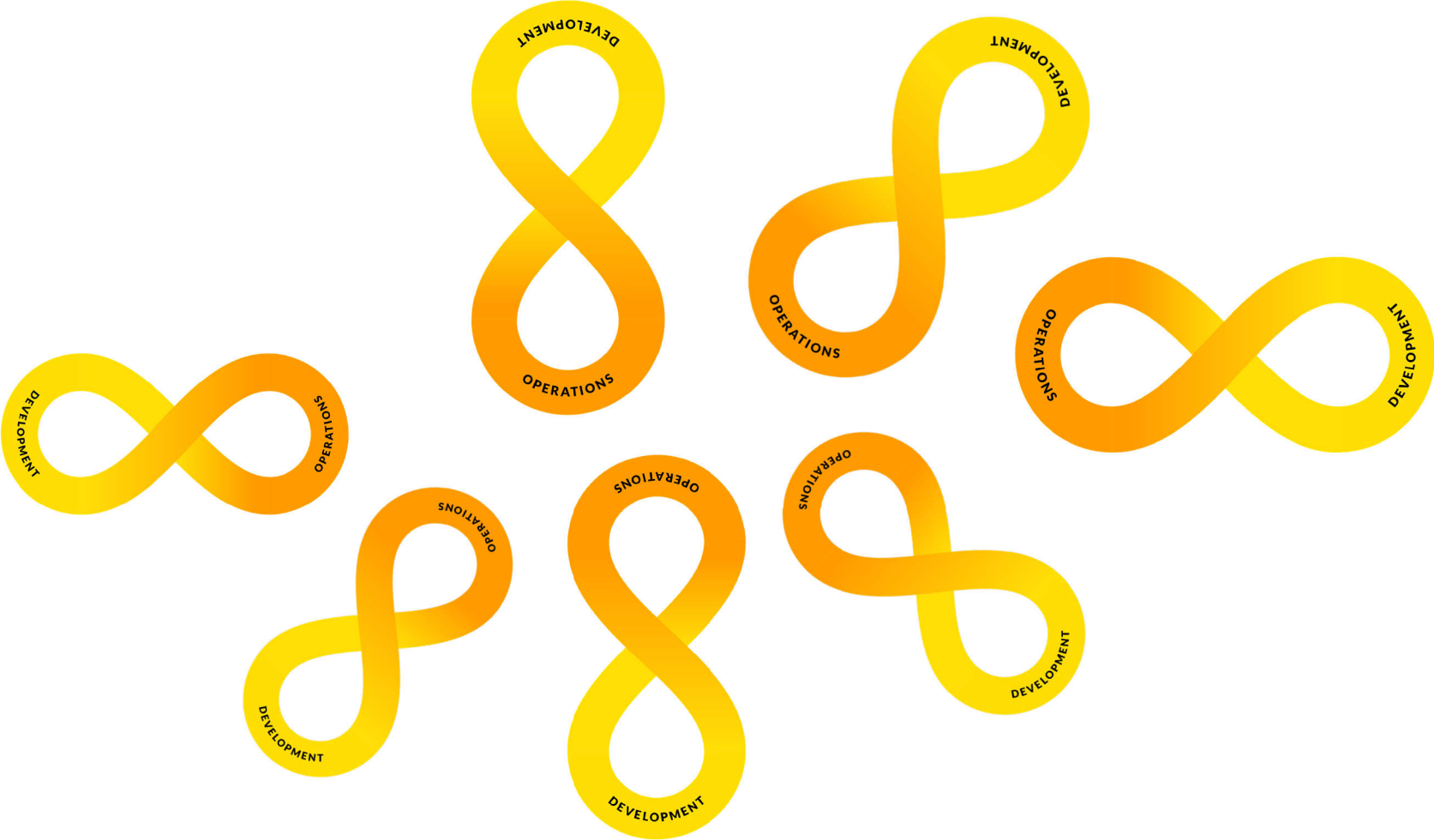Experiences

- 5G DevOps transformation lead and Senior Consultant at Eficode
- Test Coach and DevOps Evangelist in NOKIA (for 19 long years)
- Former President of the Hungarian Testing Board
- Processes Management and Compliance Work Group Chair of ISTQB
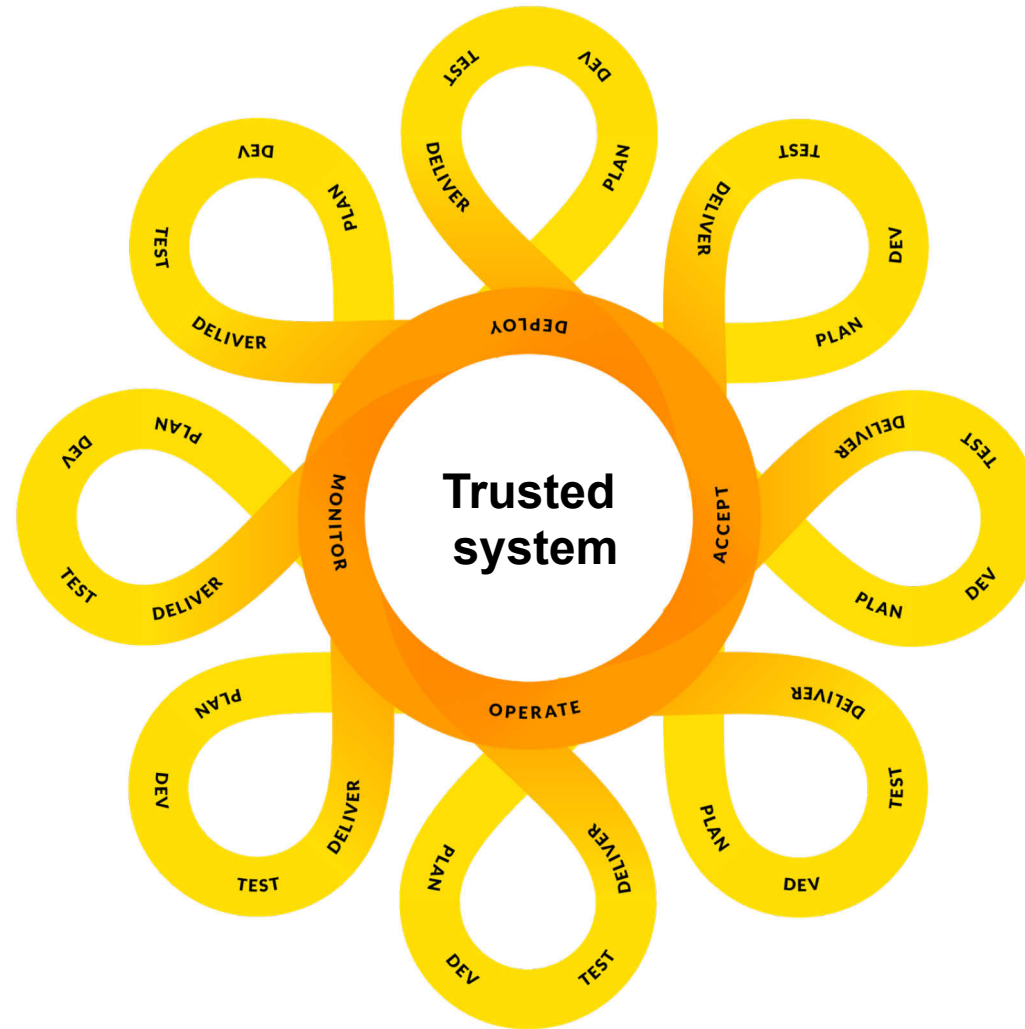- Program Committee Member of – UCAAT, HUSTEF, and EuroSTAR2021 conferences

Certifications

- DevOps DASA Foundation, SAFe SPC, Certified Scrum Master
- ISTQB CTEL-ITP-Full, CTAL-TM, CTFL-AT, CTFL
- IREB CPRE
- Lean Six Sigma Green Belt
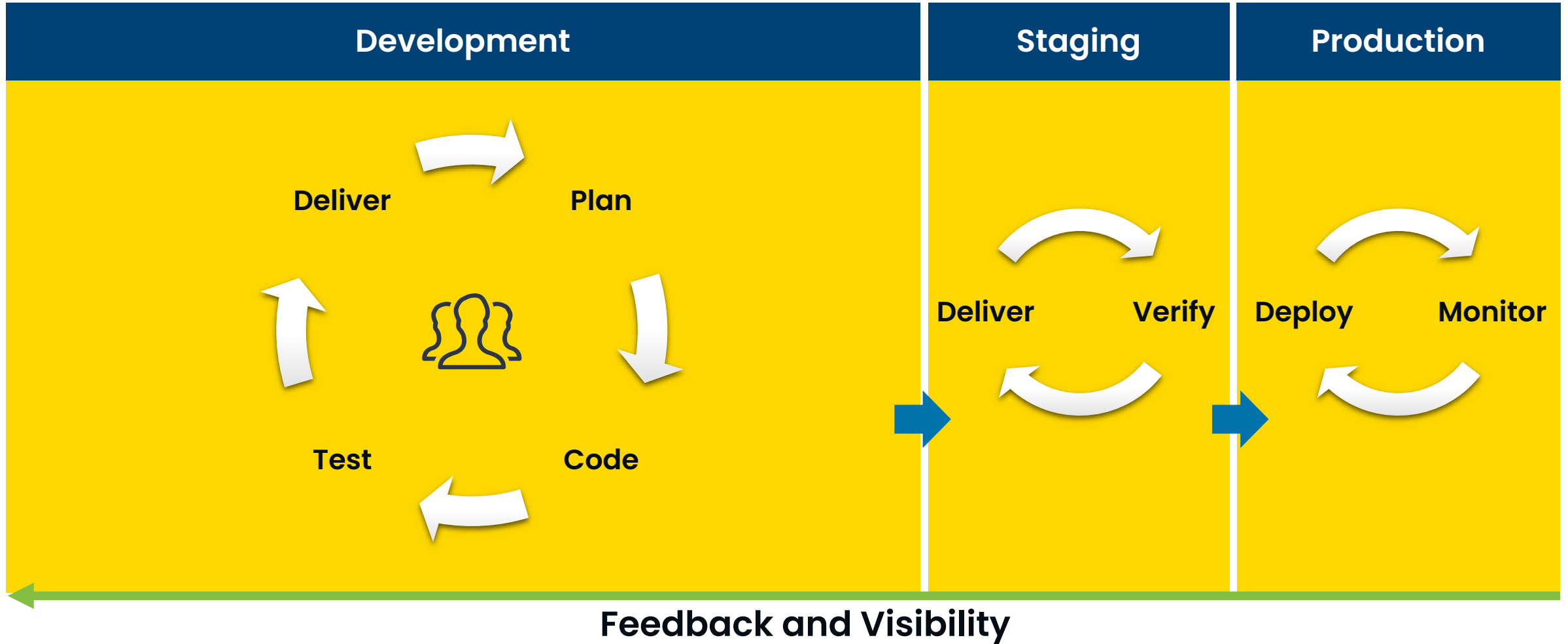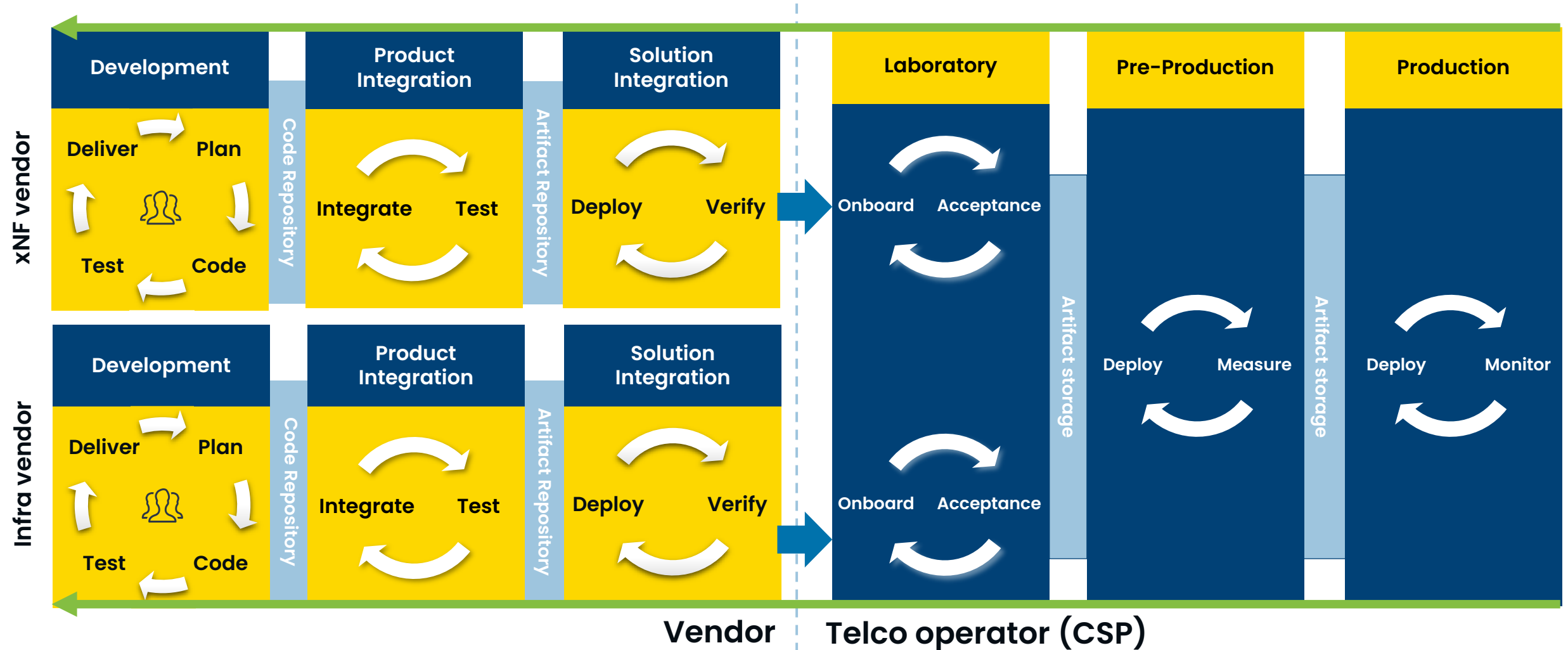- Lean Service Creation - Facilitator

Simplified DevOps pipeline

Development	Staging	Production

Feedback and Visibility

Multivendor DevOps pipeline

9th UCAAT

xNF vendor

Development		Product Integration		Solution Integration
Deliver / Plan / Test / Code	Code Repository	Integrate / Test	Artifact Repository	Deploy / Verify

Laboratory — Onboard / Acceptance

Pre-Production — Deploy / Measure (Artifact storage)

Production — Deploy / Monitor (Artifact storage)

Infra vendor

Development		Product Integration		Solution Integration
Deliver / Plan / Test / Code	Code Repository	Integrate / Test	Artifact Repository	Deploy / Verify

Laboratory — Onboard / Acceptance

Vendor　　　　**Telco operator (CSP)**

Multivendor DevOps pipeline

Test scope of xNF acceptance

xNF Integration	E2E Services	xNF Lifecycle management
Service Performance	Security	Service reliability

xNF acceptance pipeline design

Dev Lab
2 hours time slot
Trigger on change

Dev Lab
8 hours time slot
Nightly run

Reference Lab
48 hours time slot
Weekend run

Pre-Production
On demand
Within PI timeframe

Production

xNF Smoke test

xNF regression
Service smoke
xNF Feature Acceptance
xNF exploratory

Service regression
xNF performance
Service exploratory

Canary / User Test
KPI & service quality
Bug Hunting

Quality experience monitoring, and Test in Live

Shift Left opportunity:

- Artifact (xNF) vulnerability scanning
- Compatibility Certification checking (xNF vs. Infra)
- Review of xNF vendor test results

Test scope of Infra acceptance

Infra Lifecycle management

- Capacity Management
- Deployability
- Upgrade

Integration

- SDN
- Orchestration
- BSS/OSS integration

Operability

- xNF Lifecycle management
- Slicing
- Scalability
- Administration

Infrastructure Performance

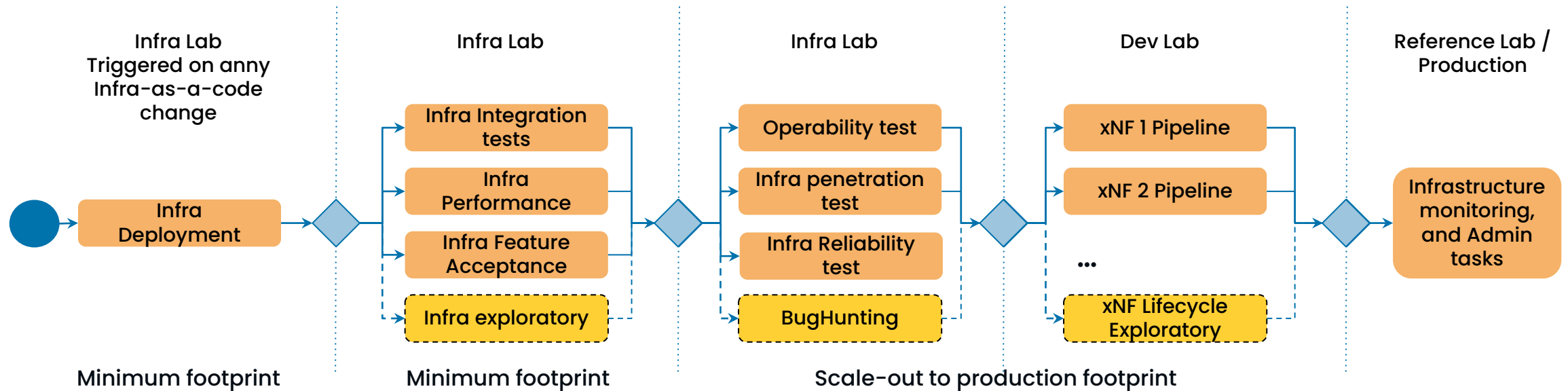- Concurrency
- Transactionality
- Consistency

Infrastructure Security

- Vulnerability Scanning
- Penetration testing

Infrastructure reliability
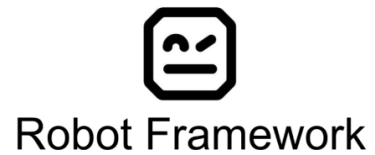
- Availability
- Recoverability
- Accessibility

Infra acceptance pipeline design

Shift Left opportunity:

- Infra SW vulnerability scanning

- Compatibility Certification checking (Infra vs. xNF)

- Review of xNF vendor test results

Test Automation and tooling

ANSIBLE

Robot Framework

ixia
IxNetwork
5G LoadCore™
Cloud Peak

JFrog Xray

Gremlin

Additional challenges and solutions

Multi-vendor environment

- supplier collaboration within a SAFe Agile Release Train

Low level of Automation

- Deployment automation with Ansible
- Test Automation with Robot Framework
- Capacity reservation for Automation work

Infra SW level outdated

- Infra SW to be taken into the pipeline.
- Infra Ageing metric introduced to follow technical debt on high level
- Capacity reservation to reduce ageing gap

Test Management role in SAFe

- QA Lead role introduced as a Quality assistance function to support Product Management work
- QA tasks are embedded in all Backlog Items, with high focus on NFRs
- Common Continuous Quality Assurance Strategy covering both xNF and Infra
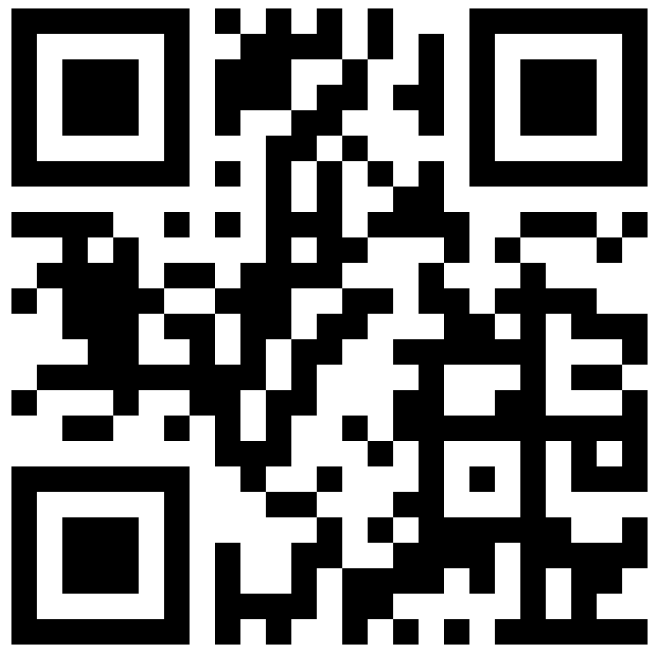
Key Takeaways

Multivendor Telco DevOps challenge is affecting Infrastructure as well

DevOps and CI/CD are relevant practices in the Telecom industry

Deployment and Test automation on all levels is key

Common Continuous Quality Assurance Strategy and Pipeline design to cover both Infra and xNF

Not only Technology, but Way of Working alignment is also needed

Any further questions?

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