Software Engineering (Principles, Policies & Guidelines)

in a Tech-Driven World (Automating Excellence)

07th February 2024

WHY, WHAT and HOW

Fahad Anwar

Office for National Statistics

WHY Software Engineering Principles/Policies…

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Purpose *(ONS technical strategy)*

To enable innovation at speed and scale which will keep the ONS providing high quality data and analysis to shape the UK, improve lives and build the future.

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Key Principles of ONS Technical Strategy

Move to Cloud

Everything as a Service

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Empowerment

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WHY Software Engineering Principles/Policies…

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Innovation at speed and scale

- Consistency
- Standardisation
- Compliance
- Risk management
- Documentation
- Communication
- Accountability
- Continuous improvement

WHY Software Engineering Principles/Policies…

Software Engineering Policies

Innovation at speed and scale

Sustainable

Accelerate

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WHY Software Engineering Principles/Policies…

Software Engineering Policies

Innovation at speed and scale

Sustainable **Accelerate**

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Software Engineering Policies to ensure
sustainable “innovation at speed and scale” with **governance**

Software Development Principles, Policies, Guidelines…

WHAT

Consultation Process to define Software Engineering Principles/Policies, Guidelines…

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Technical Advisory Group (TAG)

Comprising members from the Software Engineering, DevSecOps, Testing, and Security professions

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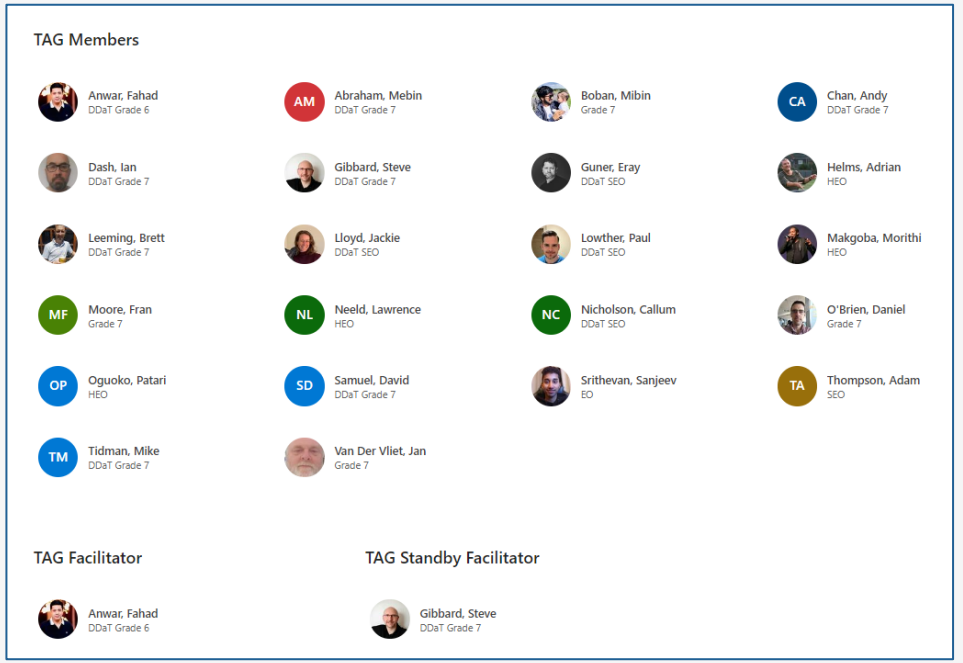

WHAT- Defining SE-PPG though Technical Advisory Group (TAG)

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Implementation Plan through Automation

- Strategy
- Principles
- Policies
- Guidelines

Software Engineering Principles/Policies (SEP's) formation through Technical Advisory Group (TAG)

Anwar, Fahad
DDaT Grade 6

SEP Policy (Why, How & Next Steps)

Terms of Reference for TAG to work on SEP

TAG Working Practice (Miro Diagram)

Software Engineering Principles

- Secure By Design
- Automate by Default
- Consistent Environments
- Design for Testability
- Get Feedback Early and Often
- Design for Emergent Reuse
- Understandability
- Performance Importance

Software Engineering Policies

- Source Code Management Policy
- GitHub Usage Policy
- Coding Policy
- Technical Documentation Policy
- GitLab Usage Policy
- Update_Change Management Policy
- Updated_Security Policy
- Updated_Code Reuse Policy
- Updated_Cryptographic Policy
- Updated_Deployment & Infrastructure Policy
- Updated_Version Control Policy
- Release Policy
- Software Design Policy
- Software_Testing_Policy_v0.9

Guidelines, Standards, Toolset (Draft)

- GitHub Internal or Private repository usage Guidelines
- Coding Guidelines
- Technical Documentation Guidelines

Supporting documents

- Communication & Implementation Plan
- Supporting Documents For Principles, Policies and...
- Design for Testability- Feedback from TISS

Key Action for next session

It was agreed that in next session TAG will review the communication and implementation plans and will review finalise contents of following:

- Coding Policy & Guidelines
- Technical Documentation Policy & Guidelines
- SEP Phase-1 release planning

Minutes of Meeting (TAG Session)

- 9th TAG Session - 16/01/2024
  - Minutes of Meeting
- 8th TAG Session - 19/12/2023
  - Minutes of Meeting
  - Recording of the Session
- 8th TAG Session - 05/12/2023
  - Minutes of Meeting
  - Recording of the Session
- 7th TAG Session - 07/11/2023
  - Minutes of Meeting
  - Recording of the Session
- 6th TAG Session - 04/10/2023
  - Minutes of Meeting
  - Recording of the Session
- 5th TAG Session - 21/09/2023
  - Minutes of Meeting
  - Recording of the Session (forgot record the session)
- 3rd TAG Session - 15/08/2023
  - Minutes of Meeting
  - Recording of the Session
- 2nd TAG Session - 01/08/2023
  - Minutes of Meeting
  - Recording of the Session
- 1st TAG Session-19/08/2023
  - Minutes of Meeting
  - Recording of the Session

Software Development Principles, Policies, Guidelines…

HOW

HOW (Approach) Software Engineering Principles/Policies, Guidelines…

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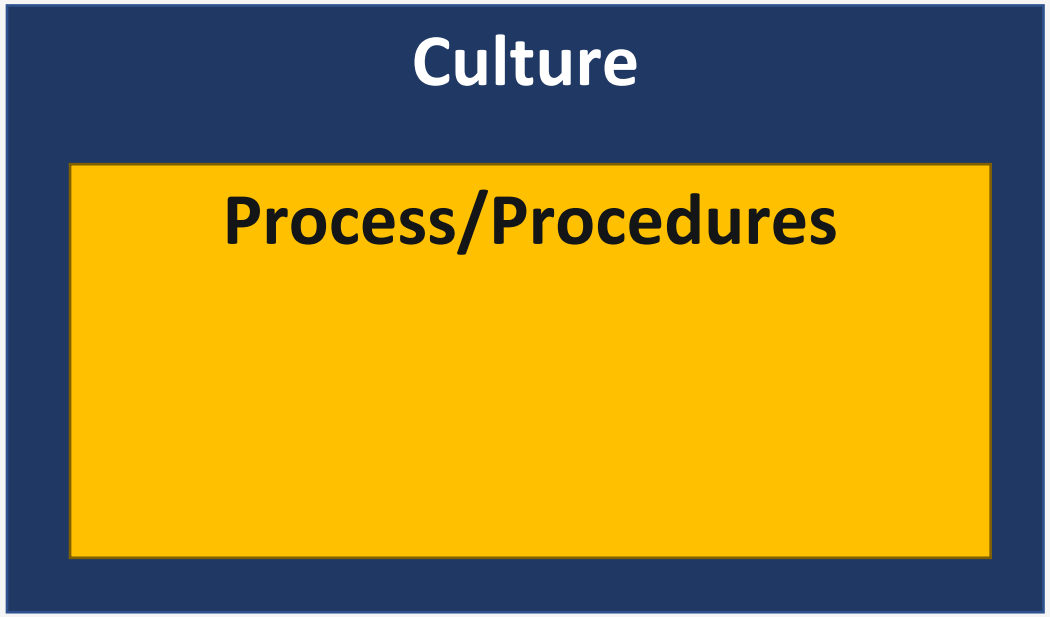
Innovation at speed and scale

Conflict

Software Engineering Policies



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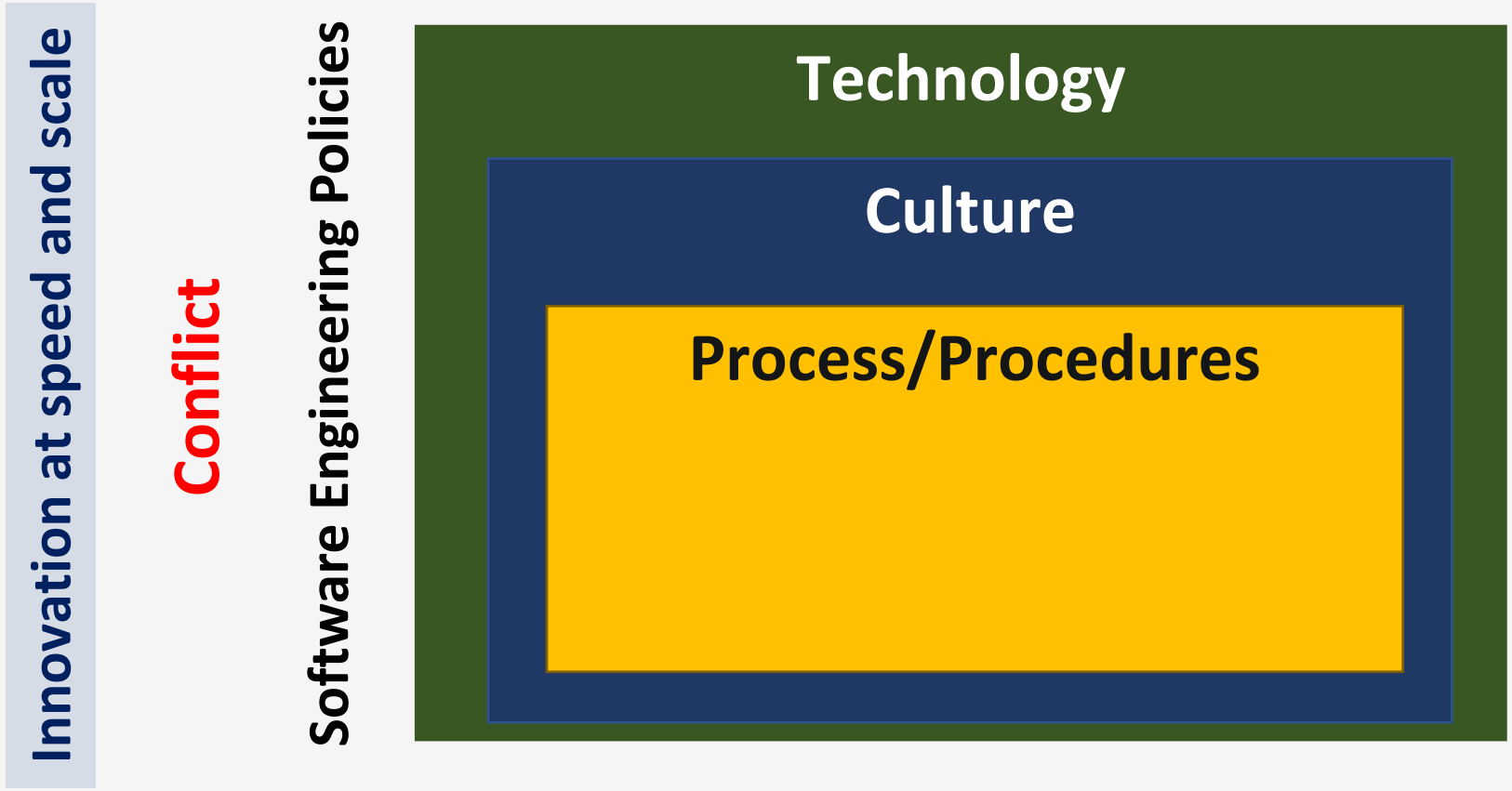

HOW (Approach) Software Engineering Principles/Policies, Guidelines…

Innovation at speed and scale

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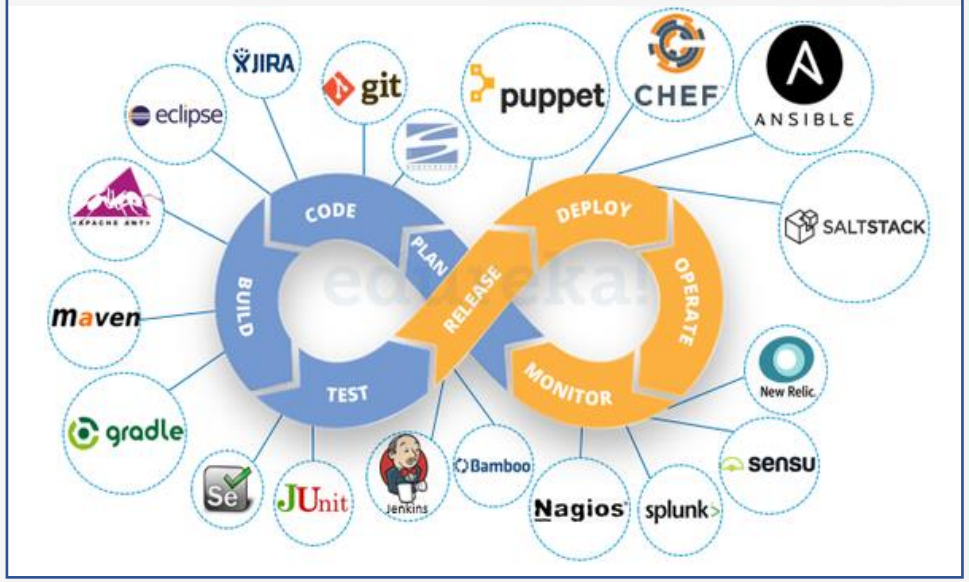
Software Engineering Policies

Technology is used to implement SEP

- Automation
- CI/CD
- Templating
- Scaffolding
- Automated non-functional testing
- etc

HOW (Approach) - SEP (use of technology)…Continue

Software Engineering Policies/Guidelines



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HOW (Approach) - SEP (use of technology)…Continue

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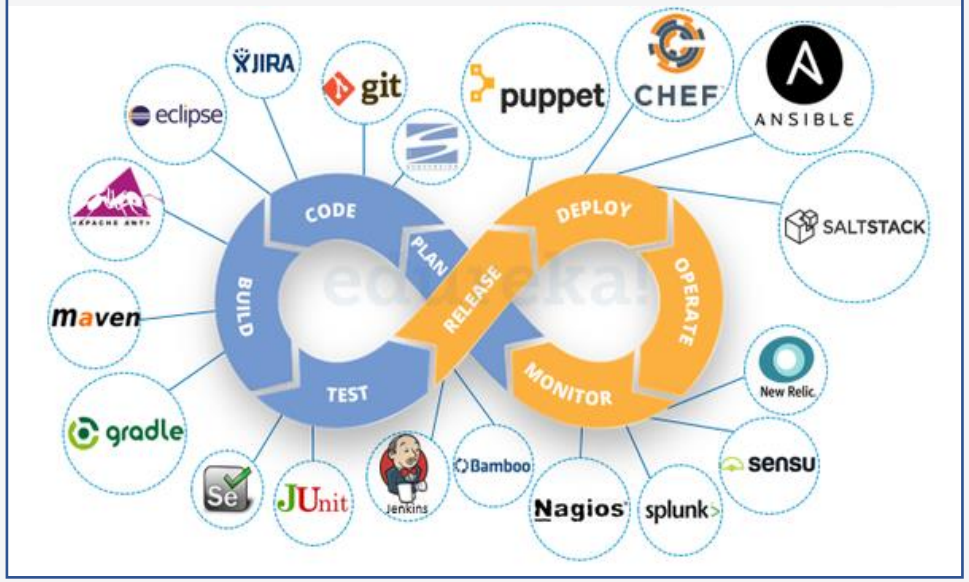

Cognitive Load for developers

Understand all different technologies

Time effort required to maintain them

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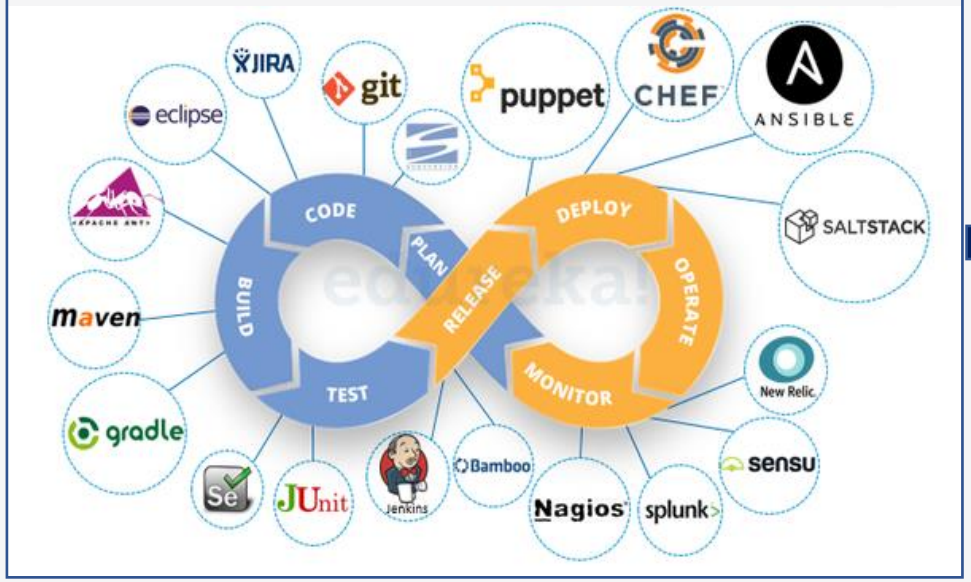
HOW (Approach) - SEP (use of technology)…Continue

Software Engineering Policies/Guidelines



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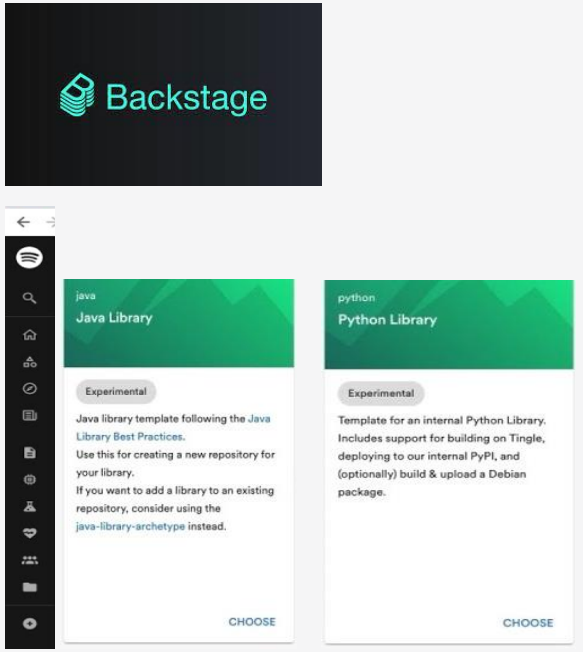
Software Developers Portal

By 2025, 75% of organisations with platform teams will provide self-service developer portals to improve developer experience and accelerate product innovation **(Gartner Report 2022)**.

Unifies infrastructure tooling, services, training, observability, cost tracking, infrastructure scaffolding, and documentation into a single streamlined development interface.



Build from the templates

1. Ensure the code quality and structure as per Coding Policy/Guidelines
2. Approved libraries are used (quality policy/Guidelines)
3. Create a GitHub repository and assign securities as per (security/ source control policy)
4. Cloud Infrastructure is source automatically covering the Infrastructure & Deployment Policy (including different environment for testing and production)
5. Test data and integration tests are setup (quality policy, security policy)

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Software Developer Portal

Demo **(use cases)**

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<u>can anybody do this for me automatically?</u>

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I need to write **ADR** as per **Technical Documentation Policy**, is that can be done through **SDP and** become part of **documentation automatically**

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I need to use Redis database for this project, **can I know if any other team has used it** and discuss the existing approach

I need to write **ADR** as per **Technical Documentation Policy**, is that can be done through **SDP and** become part of **documentation automatically**

Can I know what specific **programming languages, tools** and **framework are in use,** and in **which project?**

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Can I know which **team owns** what **Services, Website, Library** etc?

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Ok, so we have all this information available in SDP, **can I just Ask it and it tells me?**

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Can I know which **team owns** what **Services, Website, Library** etc?

We have **so many repositories/ systems**, it will take **lot of time/effort** to bring them all under SDP?

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Q & A

ADOPTION

~3000

~2000

By 2025,75% of organizations ... will provide self-service developer portals to improve developer experience and accelerate product innovation.

GARTNER 2022

~1200

BACKSTAGE ADOPTION 250+

https://github.com/backstage/backstage/blob/master/ADOPTERS.md

~4000

~2300 Repositories

160+ Teams

500+ Members

Multitude of Projects

Many Languages

Numerous Tools

Hordes of Resources

THE CHALLENGE

Endless Documentation

Engineers

VISIBILITY BEYOND TEAM
FINDING BEST PRACTICE
REUSING WORK
SLOW TO GET GOING

Organisation

VISIBILITY OF SKILLS,
RESOURCES AND TOOLING
GOVERNENCE AND COMPLIANCE