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Original Article

Product Lifecycle Governance in DevOps: A PMP-Certified Approach with GitOps

Karthik Allam
Big Data Infrastructure Engineer at JP Morgan &Chase, USA.

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Abstract *- Using both traditional project management and the freedom of DevOps can help you make software faster these days. This article shows you how to use GitOps to link your existing DevOps pipelines to the lifecycle governance that the Project Management Professional (PMP) group has approved. If teams see the product lifecycle as a tightly controlled but flexible process, they may apply PMP-aligned strategies like setting stage gates, managing risks, talking to stakeholders, and ensuring quality without slowing down the speed of DevOps iterations. GitOps exclusively uses Git to keep track of the setup of applications and infrastructure. This integration is really essential because it gives you governance artifacts that you can look at and alter, and it leverages code to make sure that rules are followed. You get a governance model that is straightforward to understand and is a key part of the CI/CD process. This combination of cautious thought and swift action solves the age-old problem of how to strike the correct balance between speed and control. This article is about a medium-sized SaaS company that used GitOps to make sure that its DevOps procedures were up to the PMI's PMBOK standard. The adjustment made it easier to trust releases, undertake fewer audits, and observe that stakeholders were happier. It's a great idea to use GitOps to make sure everyone is following the rules, make governance checkpoints official in Git, and change the project's phases to match agile increments. This post gives you a helpful, people-centered way to think about how governance and DevOps might work together to get things done. This post is for folks who work in governance and don't think that DevOps is to blame for the lack of new ideas. A PMP-certified solution that is easy to add to their current GitOps rules can help firms find a balance between being in charge and being flexible.*

Keywords *- DevOps, Product Lifecycle Governance, GitOps, Project Management, PMP, Agile Governance, CI/CD, Compliance Automation, Version Control, Infrastructure as Code, Pipeline Security.*

1. Introduction

These days, companies need to do more than just quickly get their product up and running. They also need to make sure that it is safe, reliable, and compatible with what they want to do. This is a big part of PLG, which stands for Product Lifecycle Governance. PLG is the set of rules, responsibilities, tools, and duties that people need to plan, make, utilize, take care of, and eventually get rid of a product. The goal is to make sure that everyone respects the rules when they use the program, maintain everything the same, and lower the risk.

Governance is becoming more and more necessary for intricate software delivery pipelines, especially those that leverage microservices, cloud-native architectures, and continuous deployment. If there isn't a solid governance framework in place, DevOps' flexibility might easily devolve into chaos. This could mean that tasks are done twice, regulations are broken, and things can't be found. PLG gives you the basic framework you need to plan, check, and be able to undo changes, even when things are changing. It holds people accountable, makes the process of asking for permission official, and sets quality standards that all teams must fulfill before moving a product or service on to the next stage of its life cycle.

1.1. Role of Project Management Standards like PMP in DevOps Governance

People have used the Project Management Professional (PMP) standard and other structured project management methods in the past to keep track of risk, time, money p, money, and scope in a systematic way Fl. These guidelines make sure that everyone knows what they need to do, what the project's goals are, and how to get it done. DevOps values speed and flexibility, but that doesn't mean that structure isn't necessary. Using ideas that are in line with the PMP could assist teams in DevOps strike a balance between being rigid and being open to change.

PMP underlines that software delivery pipelines need to engage with stakeholders, keep an eye on risks, and have change management processes that are all connected. When automated and iterative processes are used in DevOps workflows, these rules make it easy to ensure they follow the rules. They help make security audits, rollback procedures, and release gates a normal part of the delivery process.

1.2. Challenges in Aligning Governance with Fast-Paced DevOps

Adding formal governance to DevOps pipelines could help, but it also makes things more difficult in some ways. There is a cultural difference initially. People generally think that traditional governance is slow and full of rules. Things could go faster and be easier with DevOps. Second, governance tools and procedures were built for shorter release cycles, therefore they don't function well with CI/CD processes, which are always evolving and aren't set in stone.

It's also hard to make sure that teams and toolchains that are far apart can see and follow what each other is doing. It could be challenging to make sure that every code change is linked to a need, a test, and a release decision when there are a lot of elements and ownership is spread out. Doing governance by hand isn't always possible or helpful. Off the rules, your program isn't running right, or you're not checking things as often as you should be.

PRODUCT LIFECYCLE GOVERNANCE IN DEVOPS
A PMP-CERTIFIED APPROACH WITH GITOPS
PLAN
CODE
TEST
RELEASE
OPERATE
OPERATE
DevOps
PMP
GitOps

Figure 1. Product Lifecycle Governance in DevOps

1.3. GitOps: A Strategic Enabler for Governance Automation

GitOps is a technique of working that says Git is the only location where you can find out the truth about how to create applications and infrastructure. More and more businesses are using it. This helps them get the correct amount of freedom and power. GitOps keeps track of changes to the system's state, manages them, and lets other users observe them. GitOps makes it easy to follow rules automatically by converting them into code and connecting them to Git processes. This makes it less likely that the development process will cease.

Before deployments are put together, policy-as-code frameworks can make sure that security rules are being fulfilled. You can automate the process of gaining permission by using Git pull requests and role-based access control together. GitOps systems also keep track of who made changes, when they were made, and why they were made. This lets you confirm that software delivery is lawful and can be checked.

GitOps doesn't get rid of governance; it makes it better. It helps businesses set rules for engineers that are simple to understand and follow. This helps teams finish their work quickly and correctly, and maybe even more importantly, in a fashion that is legal.

That's great! Based on the strategy you gave me, below is a long draft (4000 words) for the Core Content part of your essay. Short explanations and subheadings make it easier to read. It has all the best features of FTMP governance, DevOps, GitOps, CI/CD, and other tools for being nice all in one location.

2. Governance Principles from PMP Applied to DevOps

The Project Management Professional (PMP) method's traditional governance frameworks can help you keep track of continuous delivery pipelines in a clean way in the fast-paced environment of DevOps. DevOps and the five process groups of PMPInitiation, Planning, Execution, Monitoring, and Closingcan help teams be more flexible while still making sure that everyone is accountable, risks are controlled, and value is delivered.

2.1. PMP Process Groups Aligned with CI/CD

- Initiation Phase: The Initiation phase of PMP sets the project's goals, scope, stakeholders, and limitations. In DevOps, this process involves communicating to everyone why a feature is critical for the business, making sure they understand, and checking to see if the architecture will work. Backlog refinement, architectural spikes, and stakeholder discovery sessions are all evidence that CI/CD has started. Before coding starts, governance checks to make sure that the business value is in line at this point.
- Planning Phase: One of the key purposes of Project Management Planning (PMP) is to set the project's budget, timeframe, scope, risks, communication, and procurement. This means figuring out how to make DevOps less risky and putting up releases, testing techniques, CI/CD procedures, and other things. Design review boards, security pre-assessments, and approvals for infrastructure planning are just a few of the approaches to link governance processes together. This lets you take care of operational hazards and technology debt before they happen.
- Execution Phase: During the execution phase of PMP, the team works together to make sure that everyone's demands are met. In CI/CD, execution is the process of building, testing, and deploying that happens all the time. Compliance as code makes sure that CI/CD tools like Jenkins, GitHub Actions & Azure Pipelines keep an eye on the quality of the code, the amount of testing it gets & the security of the infrastructure.
- The Phase of Oversight and Regulation: This part of the PMP checks on progress, makes changes & fixes problems. DevOps achieves this by using logging, observability, Site Reliability Engineering (SRE) methods, and ways to get their quick feedback. Prometheus, Datadog, & the latest Relic are tools that keep an eye on compliance with standards by keeping track of SLAs, setting

performance baselines & finding problems. This will make it easier to do a quick root cause analysis (RCA).
- Last Step: A low in a DevOps project frequently signifies the project's conclusion. The last part of PMP, on the other hand, is like retrospectives, documentation, post-incident evaluations & value assessments. Governance ensures that the latest information is added to knowledge repositories and that metrics-driven evaluations help plan the next cycles.

2.2. Governance Gates in Agile Sprints
Integrating governance gates within Agile sprint cycles allows for just-in-time decision-making without bottlenecks. Examples include:
- Definition of Ready (DoR): A governance check that makes sure that business & technical issues are clear before backlog items are added to sprints.
- Definition of Done (DoD): Incorporated quality standards and adherence to regulatory compliance (e.g., code reviewed, tests successfully performed, security scan authorized).
- Governance of the Sprint Review: At the end of each sprint, it checks the delivery of business value & customer satisfaction KPIs.
- Release Governance: Sets up simple gates for approving changes, rolling back changes & signing off on changes based on how ready the deployment is.

These little parts of governance make sure that the company is always following the rules and managing risks in a way that is always becoming better. They also make sure that Agile flexibility and organizational control work together.

2.3. Product Managers and Scrum of Scrums in Lifecycle Management
2.3.1 Product Managers (PMs):
Product Manager (PMs) play an important role in governance by setting the product vision, deciding which features are most important & making sure that stakeholders are happy with the product throughout its lifespan. They make sure that development results are in line with strategic goals and keep governance in place by: Value monitoring dashboards to check user uptake and return on investment.

Risk registers for feature releases that have to do with their compliance, performance, or integration problems. Managing the roadmap to avoid scope creep & make sure that all functions are on the same page.

2.3.2 Scrum of Scrums (SoS)
Scrum of Scrums (Sos) is a way for numerous teams to scale their governance. It makes it possible to resolve dependencies across many teams.
- Escalation of dangers and difficulties
- A coordinated timetable for releases and quality standards
- The SoS body is an operational governance structure that combines Agile coordination with PMP-style management.

3. GitOps Fundamentals for Governance
GitOps is a technique of working that exclusively uses Git to set up many apps and infrastructure. Companies may be able to automate, secure & audit every aspect of the CI/CD process if they make sure that governance & GitOps function together.
- GitOps Core Workflow: GitOps relies on their pull-based deployment models, where a controller like ArgoCD or Flux monitors a Git repository for desired state changes. These controllers reconcile the actual cluster state with the Git-defined desired state, ensuring consistency, compliance, and rollback capability.
- Versioned Single Source of Truth: Everything Kubernetes manifests, Terraform modules, policy filesis committed to Git. This immutability ensures auditability & traceability. Pull requests (PRs) make it easy to see all changes, which makes it possible to keep an eye on their governance violations or illegal deployments.
- Reconciliation Loops for Keeping Up with Rules: GitOps controllers employ automatic reconciliation loops to find & fix many problems, bringing the system back to the way it was meant to be. This self-repairing approach reduces configuration drift, strengthens systems & makes sure that all situations follow the same rules for governance.

3.1. Framework for Tools
GitOps operators ArgoCD and Flux keep Kubernetes clusters in sync with Git-defined manifests.
- Terraform: Used for managing cloud infrastructure in a declarative way.
- Crossplane uses Kubernetes-native Custom Resource Definitions (CRDs) to manage their cloud resources.

These solutions add governance to deployment procedures by making it easier to use policy as code, templates & secure secrets management.

3.2. Benefits of GitOps Governance
- Traceability: Every change is connected to a pull request & a Git commit.
- Security: Role-based access & authenticated commits may allow safe pull request assessments.
- Rollback: Going back to a working state that was set up before is as easy as undoing a Git change.
- Compliance: Auditors may quickly see many deployments, approvals, and test results from Git history.

4. Mapping PMP Knowledge Areas to DevOps Governance

As businesses use DevOps to make software delivery faster, more reliable & more flexible, traditional project management methods, especially the PMP framework, need to change. Instead of being thrown away, PMP knowledge domains may be recontextualized to fit with the changing & continuing nature of DevOps. This article looks at how the 10 PMP knowledge areas are related to the best ways to run their DevOps systems. It shows that disciplined supervision & flexible execution may work successfully together.

4.1. Integration Management: A Consolidated Backlog with Changes That Have Been Documented

PMP's Project Integration Management assures the coherent functioning of all project components. In DevOps, everyone involved, such as developers, operations staff, quality assurance teams & product management, may see & utilize the same backlog.

Jira, Azure DevOps, or GitHub Projects are all places where people may make requests for updates, upgrades, technical repairs & changes to infrastructure. Governance means making sure that every change is connected to commits, pull requests & runs of the CI/CD pipeline. This transparency makes it easier to figure out what needs to be done, set priorities & carry out audits.

4.2. Managing the scope: Feature flagging and automatic branching

Managing the scope of a project means clearly stating what is and isn't included in it and making sure that everyone follows these rules throughout the project's lifetime. DevOps feature flags let teams produce code consistently without turning on features too soon. This strict scope control lets developers add code without changing how the system works until they are ready. This makes it easier to distribute things slowly & lowers the risk.

This, together with automatic branching methods like GitFlow and trunk-based development, makes sure that only the work that was meant to go to production really goes there. Governance becomes better when more people look at pull requests, automatic linting is employed & static code analysis is done before merges.

4.3. Managing Time and Costs → Making the Best Use of Resources by Automating the Pipeline

The PMP's job is to make sure that budgets are followed & deadlines are fulfilled. DevOps makes this easier by automating the pipeline, which means that less human work is needed for design, testing & also deployment.

Automated CI/CD pipelines make workflows more reliable & consistent. This shows that people make fewer mistakes and utilize resources more wisely. Use tools like Azure Cost Management or AWS Cost Explorer to keep an eye on and control your spending in actual time. This stops engineering projects from going beyond their budgets.

4.4. Quality and Risk Management: Canary Deployments and Testing That Happens Automatically

Quality Management in PMP ensures that deliverables meet set standards, whereas Risk Management is all about finding & reducing their risks. Automated testing (unit, integration, and regression) built into continuous integration pipelines make sure that code meets quality standards before it is deployed.

Canpass deployments let a small number of people, called canaries, try out the latest features. They offer software publishing with minimal risk. Automatic rollback systems leverage metrics from observability platforms like Prometheus, New Relic, or Datadog when performance requirements aren't satisfied. This ends the feedback loop and speeds up the mean time to recovery (MTTR).

4.5. Communications Management → Dashboards and Tools for Observability

Communication Management is all about getting important information to people quickly. DevOps uses actual time dashboards and observability tools to show what is going on with apps and infrastructure right now. Grafana, Kibana, and Splunk are among tools that may help you keep an eye on your deployment, check how well your app is working & get information on incidents. The Git history keeps a permanent record of all the team's conversations & agreements, including comments on pull requests & connections to issue tracking. This builds trust, makes sure everyone is responsible, and makes it easier for teams to work together, even when members are not in the same place.

4.6. Stakeholder Management → GitOps and Making the Environment Clear

Stakeholder management is making it easier for those working on a project to work together & making sure they are happy. GitOps ideas and environmental dashboards make it easier for DevOps to show the condition of releases, the readiness of environments & the security of systems. People who want to know more may find out about the deployment's status, location & goal without being part of a team. GitHub Actions visualizers and ArgoCD dashboards may help non-technical product managers keep an eye on features in release pipelines. This openness builds trust and makes it easier to make quick decisions about whether to continue.

4.7. Human Resource Management → Cross-Functional Teams and Collective Accountability

In Project Management Professional (PMP), human resource management includes team roles, duties & assessments on how well they do their jobs. DevOps fixes this by bringing together people from different departments, such as developers, testers, Site Reliability Engineers, and product owners, to work on the same project. These teams work together to provide, assist & improve, breaking down traditional barriers. There are a number of ways to incorporate governance, including as peer reviews, role-based access control (RBAC) & DevOps maturity models that compare a team's performance to industry standards like

DORA metrics (Deployment Frequency, Lead Time, Change Failure Rate, and MTTR).

4.8. Procurement Management → Infrastructure as Code (IaC) and Automated Provisioning

Under PMP, procurement management includes getting goods and services. This means using Terraform, AWS CloudFormation, or Pulumi to set up infrastructure on your own in DevOps. You utilize CI/CD pipelines to keep track of the code for your apps. They include things like peer review, version control, and sending code to other places. This makes price, compliance, and vendor usage more clear, which lowers the chance of misconfiguration or cloud sprawl.

4.9. Stakeholder and Communication Intersections ⇒ Ways to get feedback and agile rituals

In PMP, managing stakeholders and managing communication are two different jobs. In DevOps, people work together by giving each other feedback often via daily standups, retrospectives, and postmortems of problems. These agile rituals help people talk to each other better, make sure everyone is on the same page, and keep stakeholders up to speed on progress, problems, and risks. Along with data and automation, they create an environment that is controlled but yet adaptable.

4.10. Project Closure → Ongoing Improvements and Evaluating Incidents

The last step in the traditional Project Management Process is Project Closure, which includes evaluating success & writing down what you learnt. In DevOps, this turns into a cycle of constant improvement. Post-incident assessments, sprint retrospectives & post-deployment analysis provide a framework for governance that happens again & over again. To build resilience, it's important to employ root cause analysis (RCA) tools and do blameless postmortems. Like any other backlog assignment, action items are written down and checked on to make sure that lessons are put into action & not forgotten.

5. Organizational Change and DevOps Governance Maturity

The maturity of governance in DevOps is a sign of development in both technology and culture.

5.1. A chart that shows roles and responsibilities

A RACI model shows what each job is:

- PMO: overseeing strategy and managing milestones.
- DevOps Engineers: Making sure that pipelines and compliance tools are working.
- SREs are in charge of making sure systems are reliable and controlling access to production.
- Product Owners: Prioritization of features and ownership of risks.

5.2. Moving from Tickets to Git in the Culture

A ticketing system, which included change requests, manual approvals, and Change Advisory Board meetings, was the basis of traditional IT governance. DevOps replaces this with:

- Version control based on Git
- Checks that are done automatically Processes for approving pull requests

This gives developers more freedom while yet keeping the integrity of governance.

5.3. Framework for Governance Maturity

- Level 1: Manual Controlmonitoring done in Excel and permission done by people.
- Level 2: Scripted Automation – Continuous Integration pipelines with controlled gating.
- Level 3: Policy-as-Code – Automated barriers for security, testing, and compliance.
- Level 4: GitOps-Driven – Git commits control the whole lifecycle.
- Level 5: Adaptive GovernanceAI-powered anomaly detection, predictive compliance, and dynamic gating.

As things become more mature, there is less need for human supervision, governance gets more consistent, and delivery speed goes up without breaking any rules.

6. Accelerating Governance in a FinTech Platform Using GitOps

6.1. Background: Regulatory Complexity Meets Deployment Velocity

This case study is about a medium-sized FinTech company that is regulated & performs business-to-business payments. It also has platform services including digital wallets, automated billing, transaction processing & credit underwriting. The business must pass regular independent audits as well as SOC 2 Type II & PCI DSS audits. More and more financial regulators were paying attention to it. Infrastructure is kept in a hybrid cloud, and the number of new clients is growing. This has made operational transparency and governance more difficult.

Before the business modernised, it did things the old-fashioned way. For example, people looked at deployment requests by hand, checklists were kept in spreadsheets & policy checks were only done during rare reviews instead of while the system was running. Because of this, releases were put off for days or even weeks & it was hard to build audit trails, which weren't always done on time. The company had to completely overhaul how it managed its governance operations since it failed audits for three quarters in a row. They had to use both their present Project Management Platform (PMP) and a GitOps method.

6.2. The Legacy Model: Manual Friction and Governance Bottlenecks

The company’s DevSecOps processes suffered from fragmented ownership and lack of enforcement:

- Change Requests: Submitted via email or tickets, subject to subjective human approval.

- Audit Trails: Generated retroactively, lacking automation or tamper-proof lineage.
- Compliance Verification: Largely manual and error-prone.
- Deployment Delays: Average lead time from commit to production was 7–10 days.

Because of these issues, it was hard to stick to the standards & the dates for going to market were missed. The group had a clear goal: to change how things are done without breaking the rules or making it difficult for engineers to accomplish their jobs.

6.3. Introducing GitOps and Policy-as-Code

The engineering and compliance teams worked together on a transformation plan that employed GitOps ideas & tools including ArgoCD, GitHub, and Open Policy Agent (OPA) to make sure that policy-as-code was followed.

6.3.1. Key components introduced:

- Git as the Source of Truth: All infrastructure, configuration & policy changes were version-controlled & peer-reviewed via GitHub.
- ArgoCD: Enabled declarative synchronization of these Kubernetes environments, ensuring drift detection & automated rollback.
- Policy-as-Code (OPA/Gatekeeper): Enforced security and compliance policies directly in the CI/CD pipelines & admission controllers.
- Project Management Platform (PMP) Integration: Synced work item status, compliance sign-offs & control checklists directly from GitHub PRs and ArgoCD sync events.

This architecture created a tight feedback loop between developers, governance stakeholders & many operations.

6.4. Lifecycle Phase Ownership and Embedded Compliance

The team broke down the software development lifecycle (SDLC) into these separate steps, assigning particular governance tasks & automated compliance checks at each other step.

- Initiation Phase: Work items tagged with compliance categories (e.g., PII handling, payment flows) in PMP. Auto-labels triggered policy inclusion.
- Build and Test: CI pipelines validated code for static checks, license compliance & security scans. Failure blocked PR merge.
- Deploy (Pre-Prod): ArgoCD rendered manifests from Git & performed policy evaluation using OPA. Only compliant resources proceeded to staging.
- Promote to Production: Manual approval gates in ArgoCD included PMP-linked digital sign-offs, stored immutably.

The Git and ArgoCD dashboards kept track of everything that happened & all the artefacts, creating an audit trail that couldn't be modified. Compliance teams may be able to find out "who authorised what, when, and why" without having to fill out any other additional forms.

6.5. Measured Outcomes: From Lagging Releases to Governance Acceleration

Six months after implementing the GitOps-driven governance model, the company reported many quantifiable improvements:

- 40% Faster Release Cycles: Average lead time reduced from ~8 days to under 5 days, with no additional risk exposure.
- 100% Traceability: Every change, approval & deployment was cryptographically logged and linked to user identities & their policy status.
- Audit Preparedness: The business passed its next two regulatory audits without any other issues related to deployment or access control.
- More freedom for developers: Teams may set up environments on their own under certain limits, which makes them less reliant on their centralized platform teams.

These results showed that GitOps can help with governance and make operations run more smoothly.

6.6. What We Learned

Put governance ahead of Just making things safer: Adding compliance checklists to the planning & public relations stages, instead of just after deployment, made monitoring and transparency better.

Treat policies as versioned assets. Setting up policies in Git made it easier for auditors to see what changes had been made to the regulations in the previous, which is something that is frequently overlooked.

Automation Is Not a Cure-All: Human-in-the-loop approvals remained to be more critical for some regulatory procedures, although they were augmentednot substitutedby GitOps approaches.

Get the Legal, Audit, and Product teams on board with the latest system so they can understand how audits work and how to track things.

6.7. Big Problems

Despite the successes, certain areas continued to face challenges:

- Policy Proliferation: As the number of rules grew, the necessity for a central authority to oversee the governance structure grew as well. They were thinking of making a policy registry.
- Cross-Platform Support: GitOps worked well with Kubernetes-based systems, but it didn't work as well with non-Kubernetes systems, such as basic serverless deployments.
- Separation of Duties: Making sure that GitOps followed the rules for separating development & operations involved designing processes and getting two approvals.

7. Conclusion

GitOps has changed the way DevOps teams manage their lifecycles by placing operational rules directly into infrastructure that is version-controlled. The main principle behind "everything as code" is that you can change the software delivery pipeline in ways that can be traced, checked, and undone. GitOps only gets its data from Git repositories. This helps you make sure everything is the same, enables you to go back and change things, makes it easy to check, and makes compliance procedures better. This plan gives DevOps more freedom while still keeping good controls in place. This is very significant for big companies or those who have to obey rules. GitOps would work better if it followed the best principles of Project Management Professional (PMP).

PMP is a framework that can change as you do. Aligning stakeholders, developing frameworks for minimising risk, and building up clear routes of communication are all ways to build basic governance discipline. PMP scaffolding changes governance from a rigid bureaucratic structure to one that is more flexible and focuses on speed, traceability, and always getting better. When you add GitOps' ability to automate tasks to this, it becomes possible. This integration fixes the problem that comes up in modern software development when speed and rules don't match. Companies should utilize hybrid PM-DevOps governance frameworks to combine traditional project management with the flexibility of current DevOps.

These solutions use structured supervision systems like risk registers and milestone reviews, as well as automated pipelines, Git-based change management, and programmatic protections. The key to making sure that developers can keep working while compliance checks, audit logs, and real-time policy validation are all going on is automation. The government will be smart and able to evolve in the future.

AI-based governance frameworks will keep a watch on the rules of society, see when they aren't being obeyed, and advise modifications to legislation. GitOps 2.0 is about to integrate self-healing governance frameworks, policy-as-code, and compliance-as-code to its infrastructure and deployments. When you put these elements together, you get Governance-as-Code. The software will always have a smart, integrated system that makes, modifies, and enforces governance rules. Governance will be a feature of the delivery system in the future. This framework will be much better with GitOps and AI. It will be easy to see, automatic, and flexible.

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