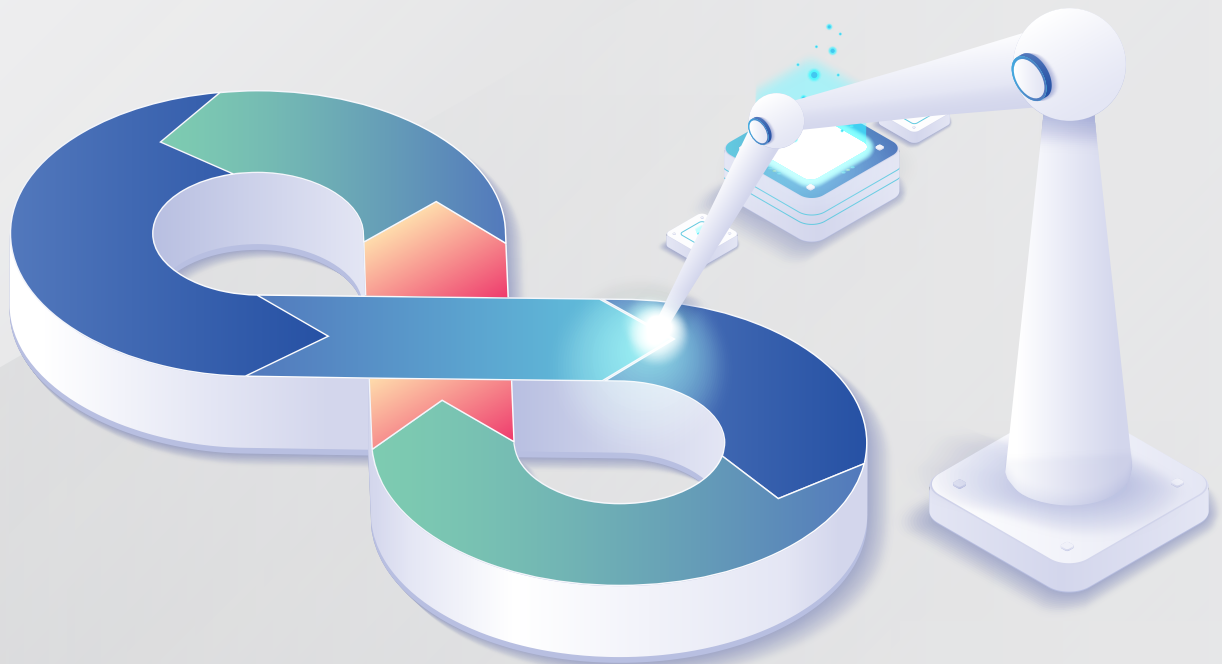


POV

XOps

Demystifying DevOps

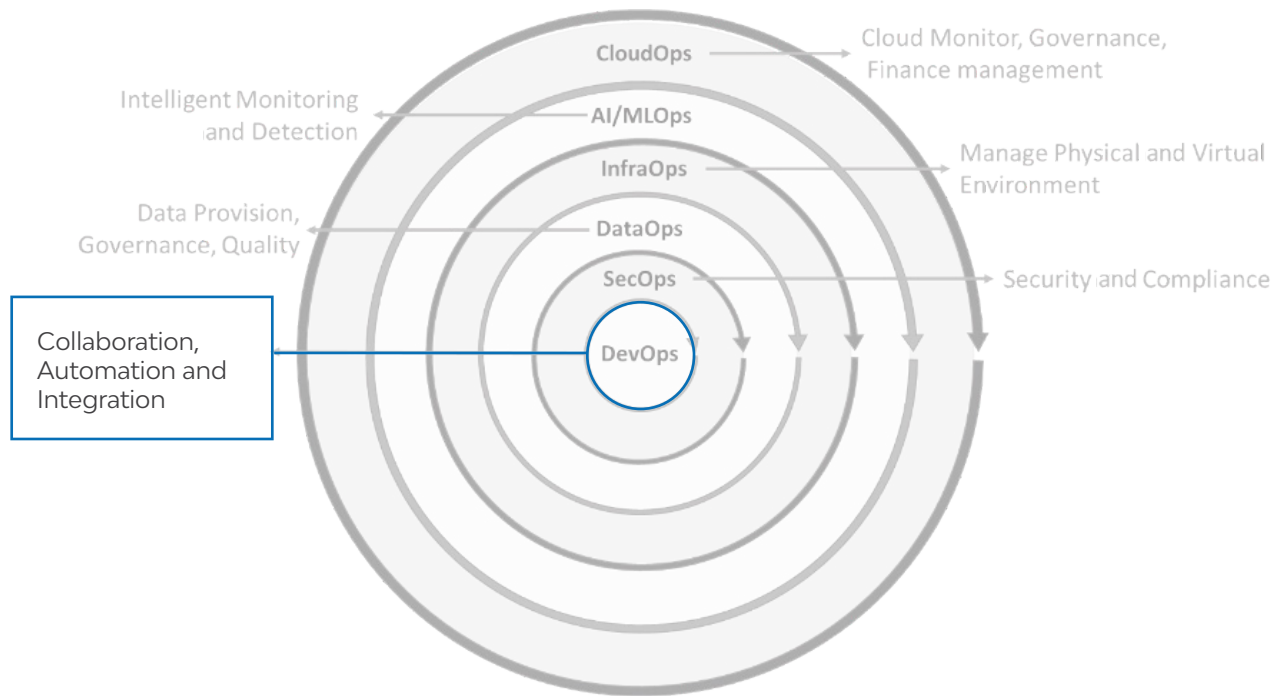


Overview

Let us start with the basics – How did the term DevOps come into existence? It's a simple amalgamation of Development and Operations, however, the complexity lies in the set of processes that combine these two important aspects. The core aim is shortening the delivery cycles, and providing continuous delivery while maintaining high quality.

While the competition advances, it requires applications/software to become more agile, requiring enterprises to adopt the principles of DevOps based on their maturity levels.

It is important to highlight that DevOps is not just about tooling and configurations, rather it is the right blend of practices and philosophies that span across people, processes, and technologies. It would not be incorrect to mention that XOps begins with 'DevOps'.



Current/Future Trends

Based on the industry trends, the current state of DevOps is aligned to any deviations that happen in the development tools and technologies. Here are the major ones.

Container Technologies

With an increase in application modernization, some of the key technologies that are a backbone of this transformation are container technologies – particularly Docker and Kubernetes. These have a transformational effect on application development across today's software-centric organizations. Some of the trending solutions that provide containers as a service are –

- **Amazon Elastic Container Service**
- **Amazon Elastic Kubernetes Service**
- **Red Hat OpenShift**
- **Rancher**

Modern DevOps tools

The adoption of microservices at enterprises has been growing exponentially and become a standard pattern of application modernization. This has also led to an increase in SaaS-based DevOps tool offerings as a robust DevOps pipeline is a key enabler in this modernization journey.

The rapid changes in applications and the need to be deployed efficiently while running applications in a more secure manner have led to more tools being incubated in the DevOps landscape. Some of the trending ones are –

- **GitHub Actions**
- **Argo CD**
- **GitLab CI**
- **Circle CI**
- **Spinnaker**
- **Bamboo**
- **Tekton CD**
- **Jenkins (CloudBees)**

DevOps tools for Databases

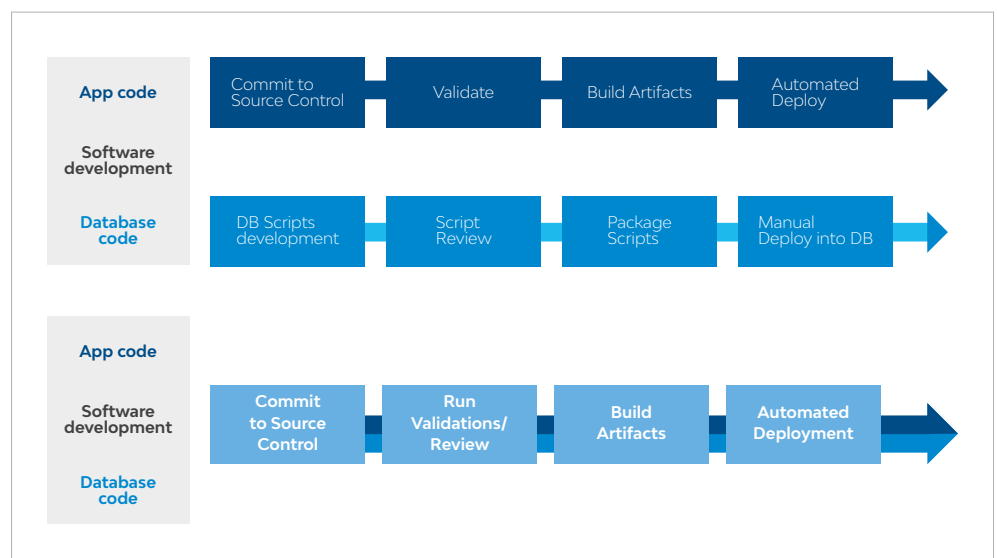
A meticulously and thoughtfully planned approach towards including any database changes as part of a DevOps process will certainly accelerate the delivery of database changes and any approval or release process is generally the last milestone of any delivery.

The reason behind integrating database change capture as part of a DevOps process is to increase the speed of delivery of any database modifications/deployments.

Some of the popular tools mentioned below empower your enterprise landscape with capabilities around DevOps for Database.

- **Liquibase**
- **Datical**
- **Redgate**
- **DBMaestro**

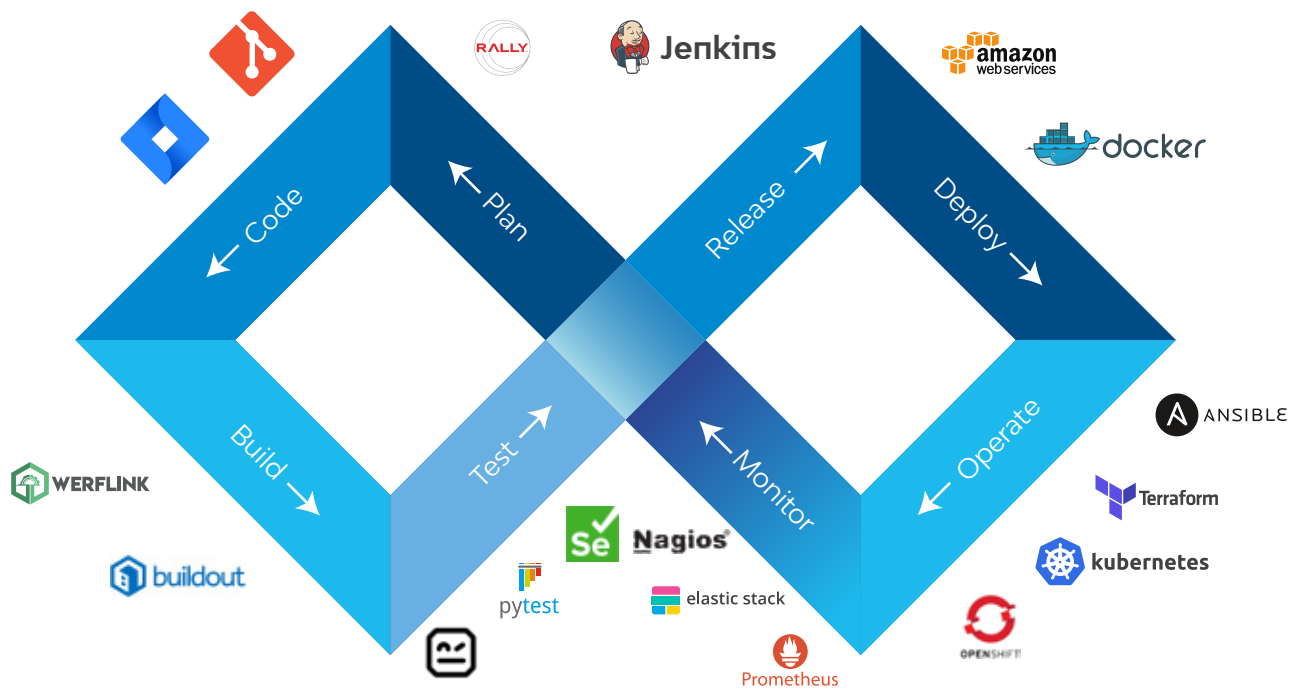
These trends also lead to some tooling adoption and related changes in the ecosystem as well as an upskilling opportunity.



DevOps Lifecycle

The lifecycle of DevOps is vital for building an application with a robust release process, security, and cost efficiency for the customers. Now traditionally, we would focus a lot of our efforts on the CI side of DevOps, however, it's the CD (Continuous Delivery) that would eventually matter when it comes to success.

It is critical to note and understand that a lot of errors are induced between writing the code and deploying it. Longer wait times to deploy lead to a bigger gap in code differences and slower execution cycles. That is exactly why it is necessary to solve the CD aspect and not just the CI part of DevOps. Having some CD is always better than no CD on your release cycles. The below infographic gives you a visual representation of some trending tools in your CI/CD - DevOps lifecycle -



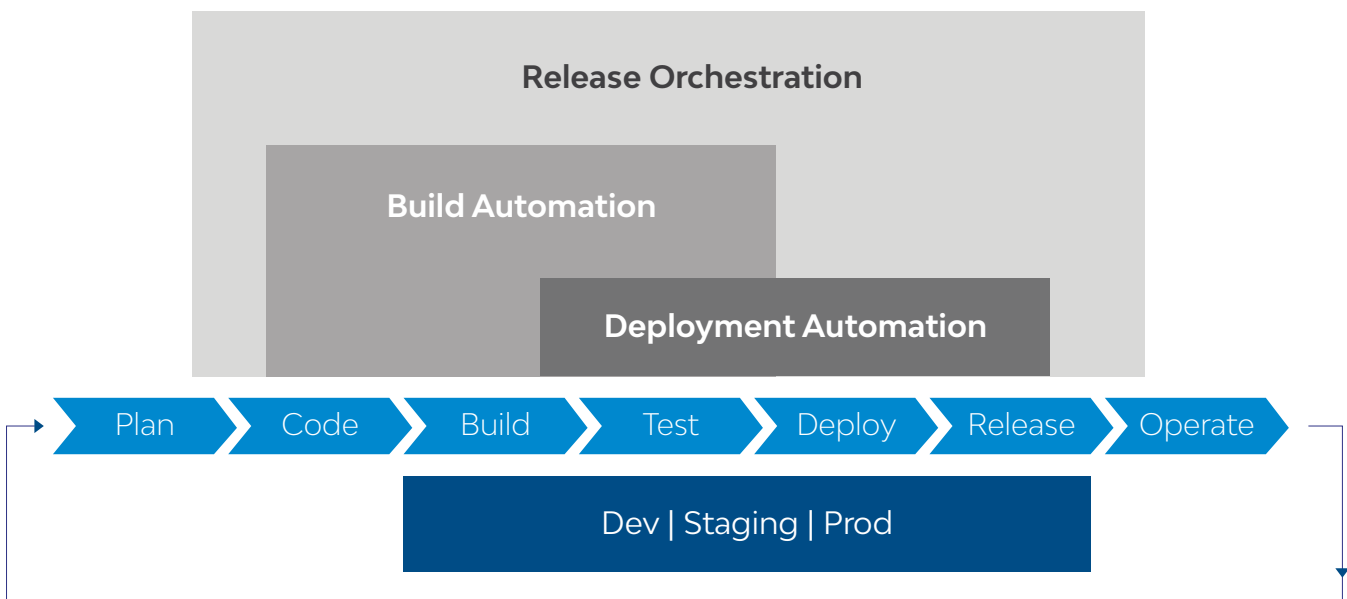
Release Orchestration

What does it take to solve the CI/CD aspects? Is it just the tools that solve the problem? Well, not really – it's the 'Release Orchestration' practice that has been continuously changing and evolving with the rapid changes in software development practices.

The release management process includes – Plan, Build, Test, Prepare, and Deploy as its primary phases. Building and maintaining a sustainable release management process relies on the shoulders of effective automation and collaboration.

Some of the best practices include but are not limited to –

- **Reducing the gaps/bottlenecks.**
- **Rapid feedback loops.**
- **Integrated testing cycles.**
- **Reduction in toil and increase in automation.**
- **Effective review process.**



The release orchestration relies on the following two paradigms, one taking care of the CI aspect while the other caters to the CD aspect of DevOps –

Branching Strategy

Git-based

Microservices as we know are isolated blocks that are weaved together to build a solution process or a business module. This technique uses master and development/feature branches. Other interrelated branches are made available viz. release and hotfix. This is useful when defined releases are planned.

Release-based (Trunk-based)

In this strategy, the teams do not continuously deploy master to production. Instead, they generate the master branch for every sprint by creating a branch for each release. This strategy is useful for teams that build for many small features.

Deployment Strategy

Rolling Updates

The fundamental principle is to update the running instances of the application with an updated release. The nodes/VMs in the target environment are gradually updated with the higher artifact version in batches.

Blue-Green Deployment

Identical environments are set up – Blue for staging and Green for production – both serving different versions of the application. Once the updated release has been tested on the Blue environment and an acceptance is obtained, traffic is shifted from Green to the Blue environment and then switches to the production once the deployment is successful.

Canary Deployment

This deployment strategy is considered one of the least risky patterns – the application or service is released incrementally to a small subset of users. The infrastructure in the target application environment is updated in incremental phases.

Custom/Multi-Service Deployment

In a multi-service deployment, the nodes within a target environment are updated with multiple new services parallelly. This comes in handy for application services that have service or version dependencies, or if you're deploying off-hours to resources that are not in use.

Measurements of DevOps and Business Benefits

Several measurements can be considered in DevOps. Below are some of the Key Performance Indicators and related metrics:

KPI	(Measurable) Metrics	Business Benefits/Outcomes/Impact
Speed	Lead time to market Mean Time to Recovery (MTTR) Sprint velocity Release frequency.	Faster feature rollouts Higher customer satisfaction Enhanced customer experience.
Security	Application vulnerability False positives Security defects.	Reduced vulnerabilities Reduced false positives Reduced defects on security.
Quality and Reliability	Change failure rate Application availability Technical debt Meantime between Failures (MTBF).	Improved application uptime Reduction in technical debt Improved product quality.
Cost	TCO IT Spend.	Increased ROI Reduced OPEX/IT (Dev and Ops) spend.

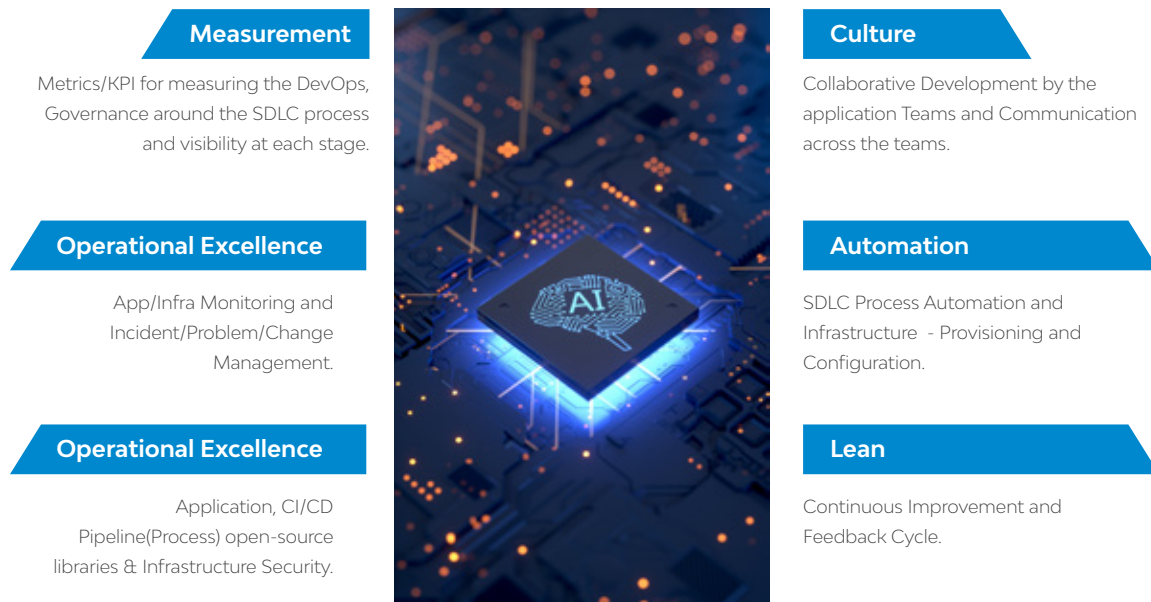
Our Accelerator/Frameworks

Developing a collaborative culture, product-centric mindset, and automation are critical prerequisites to successfully adopting DevOps in any enterprise. Value streams in DevOps are everything in the software delivery lifecycle (SDLC) from idea to production needed to deliver software products or services to customers. We at LTIMindtree believe in delivering and inculcating these Value Streams to the customer and solving for its challenges, our Maturity Assessment Framework and Accelerator are such value stream systems -

By 2023, 70% of organizations will use value stream management to improve flow in the DevOps pipeline, leading to faster delivery of customer value.

Src: <https://blogs.gartner.com/manjunath-bhat/2021/11/12/gartner-publishes-detailed-market-guides-for-value-stream-platforms/>

LTIMindtree's DevOps assessment framework is designed to help teams to assess their current maturity level and define the target state as part of the DevOps transformation journey. The assessment is based on LTIMindtree's 6D model with the following six paradigms of maturity.



Using these six dimensions, LTIMindtree measures the DevOps Maturity index of the team/programs under consideration. We mutually agree on the as-is state and the to-be state and then identify the processes and tools needed.

LTIMindtree Canvas DevOps Accelerator

LTIMindtree Canvas DevOps has been designed to address these enterprise challenges which are part of their DevOps transformation journey. LTIMindtree Canvas DevOps is a comprehensive suite that enables continuous assessment, end-to-end secured tool integration and CI/CD automation, and value stream-based deep insights into project and portfolio ALM/RLM lifecycle. It is a self-service DevSecOps platform for automated enablement and persona-based governance.

Its key features include:



Web-based survey to measure As-Is DevOps maturity.



DevOps Maturity Radar for current and target state.



Analysis and recommendations for the identified gaps to re-align DevSecOps processes and culture.



Real-time tracking of the DevOps Maturity Index.

Author



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Dharmesh is a DevOps Architect for Cloud Practice at LTIMindtree. He has 15+ years of IT experience with a rich background in implementing end-to-end DevSecOps solutions both on-premises and on public cloud platforms. He is proficient in developing and architecting Cloud/Digital/DevOps strategies for Enterprise Applications. Beyond work, Dharmesh likes traveling, back-packing as well as trekking off in the mountains.

LTIMindtree LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 84,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree – a Larsen & Toubro Group company – combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit <https://www.ltimindtree.com/>