



Demystifying DevOps

- Uday Kumar

About Addteq

- DevOps & ALM Specialists
 - SDLC Process Experts
 - Automation Experts
 - System Integrators
 - Configuration Management Experts
- Atlassian Partners (Platinum)
- Jenkins Enterprise Partners



Jenkins



About Uday

- Overall 13+ Yrs experience in Software Industry
- Certified Product Manager, SAFe Program Consultant, Kanban Trainer
- Favourite topics :
 - Products, Process
 - Automation
- Started career as J2EE Developer at Tata Steel (2003)
- Moved to GE (2005)
 - Senior Developer
 - Tech Lead
 - Project Lead
 - Project Manager
- Currently working as Product Manager / ALM and DevOps consultant at Addteq (from 2013)
 - DevOps and ALM Process Consulting
 - Conceptualized solutions @ DevOps and ALM area
 - Delivered various Atlassian Implementation Projects
- On personal front, watch Indian Cricket matches as much as possible (IPL to Test Matches) apart from playing with my one year kid

DEV - OPS

After development complete (unit of work) they think the job is done.

They handover to operations with a document on “ How to bundle & deploy instructions”

On problems, Developer standard response “IT IS WORKING IN MY ENVIRONMENT”

They follow instruction document and more often they face issues. (Build, Package, Deploy (Test/Staging, Prod, Cluster)



Things do not work the way it is expected.

- ★ Innovative
- ★ Disruptive
- ★ Lack of IT Operations Knowledge

- User Focused
- Stability / Reliability (HA)
- Lack of Development Knowledge

Potential problems :

- Developer provided Instruction document can miss some step(s)
- Operations team following instructions could miss some step(s)

Solution :

- Automation ??
- Work as team ??

In **Dev** and **Ops**

Automation



Work as Team

Not Sufficient

Objective is break the silos

Breaking the silos? How ?

With **DevOps**

Dev

Integration

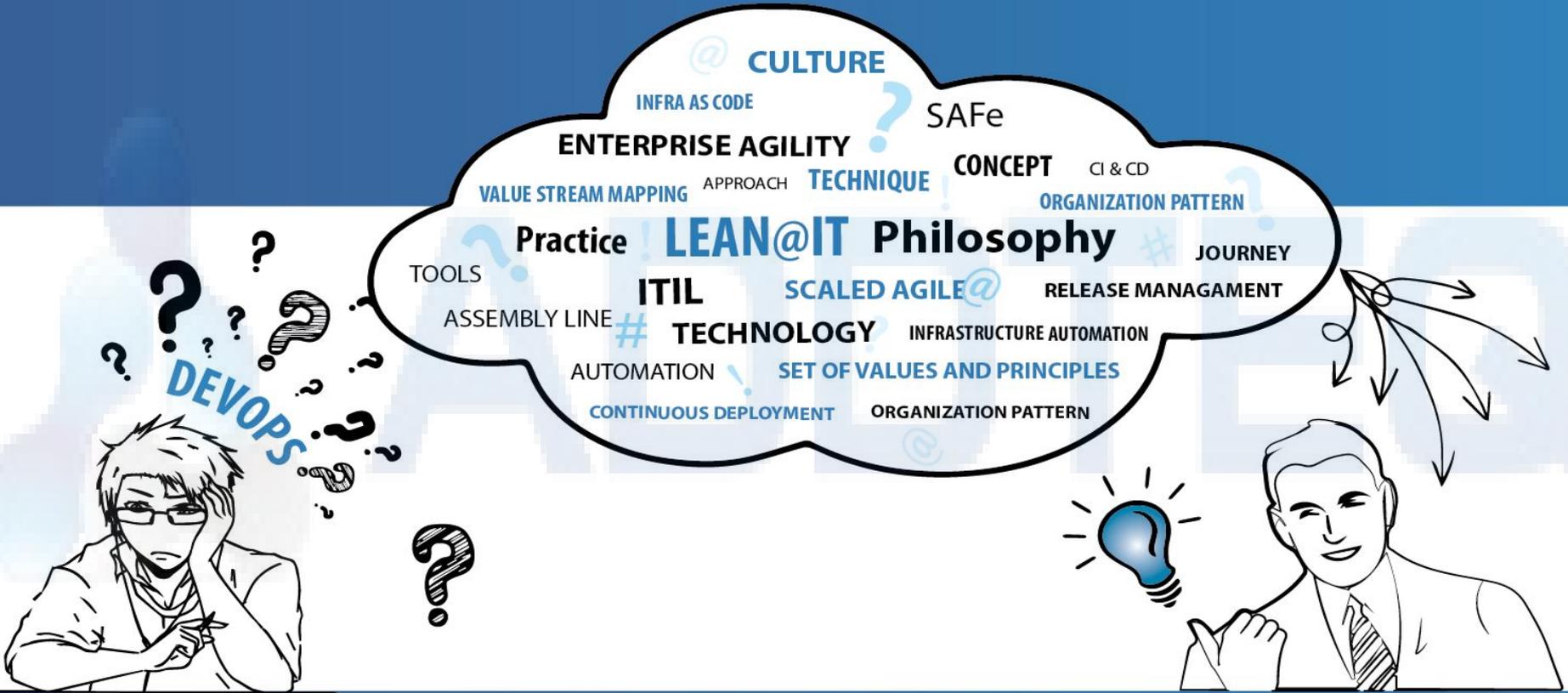
Collaboration

Communication

Ops

Across Culture, Process & Technology

What is DevOps?



● Why DevOps?

- What is DevOps?
- DevOps Technology Overview
 - ALM
 - CI + CD
 - Infrastructure Management & Automation
 - ALM as DevOps Platform
- How to Adopt DevOps
 - DevOps Maturity Model
 - DevOps Adoption Model

Business Goal..

NET PROFIT . ROI. CASHFLOW

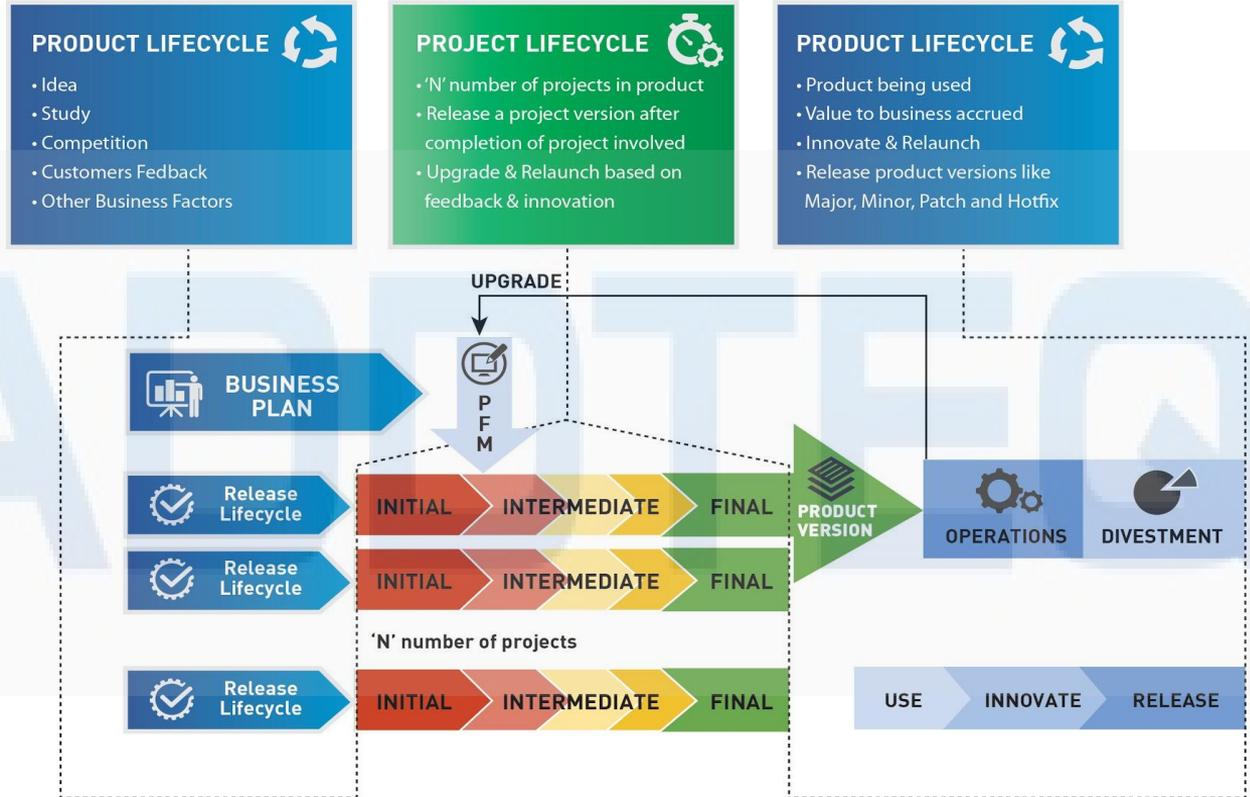
QUALITY
TIME TO MARKET
REDUCE COST

UNINTERRUPTED
FLOW OF
PRODUCT
DELIVERABLES
TO USERS

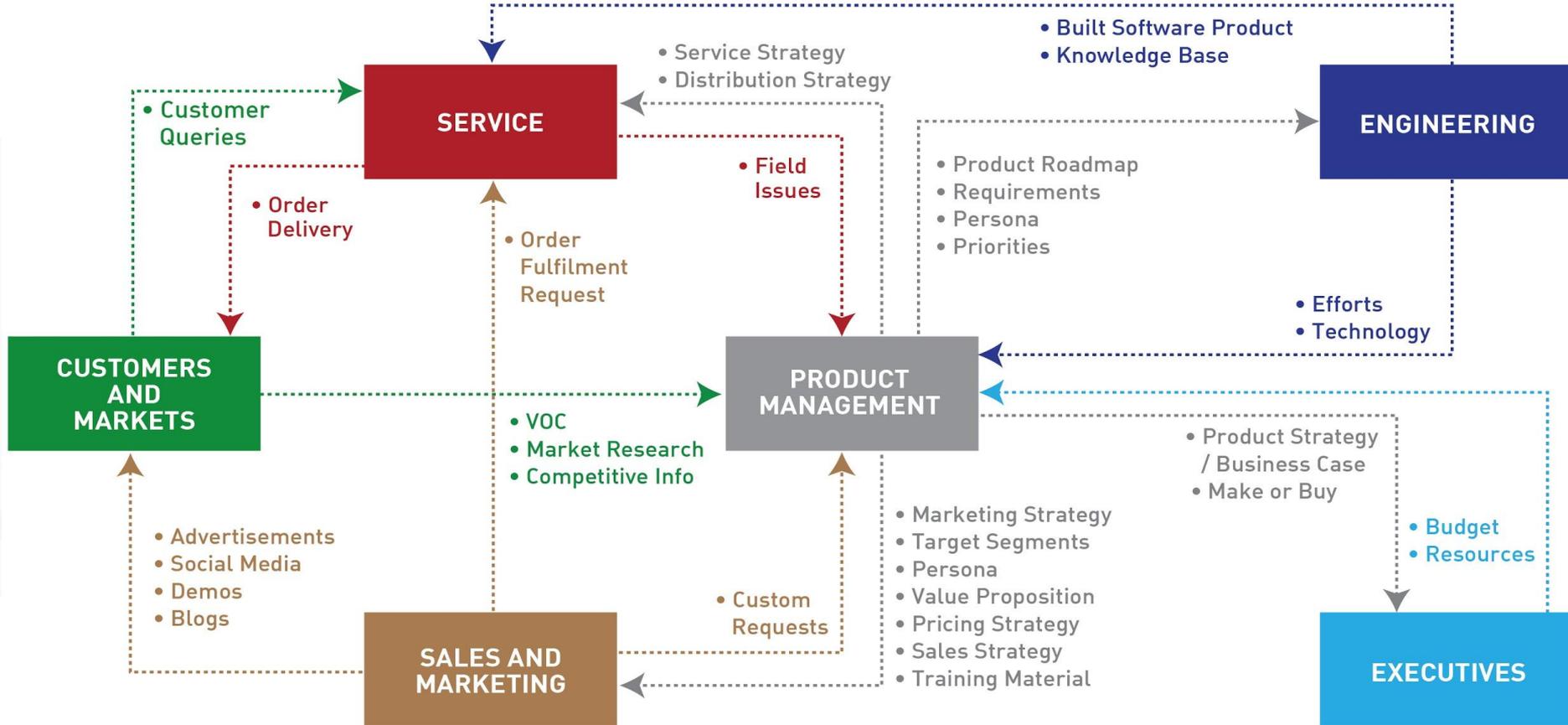


Products & Projects

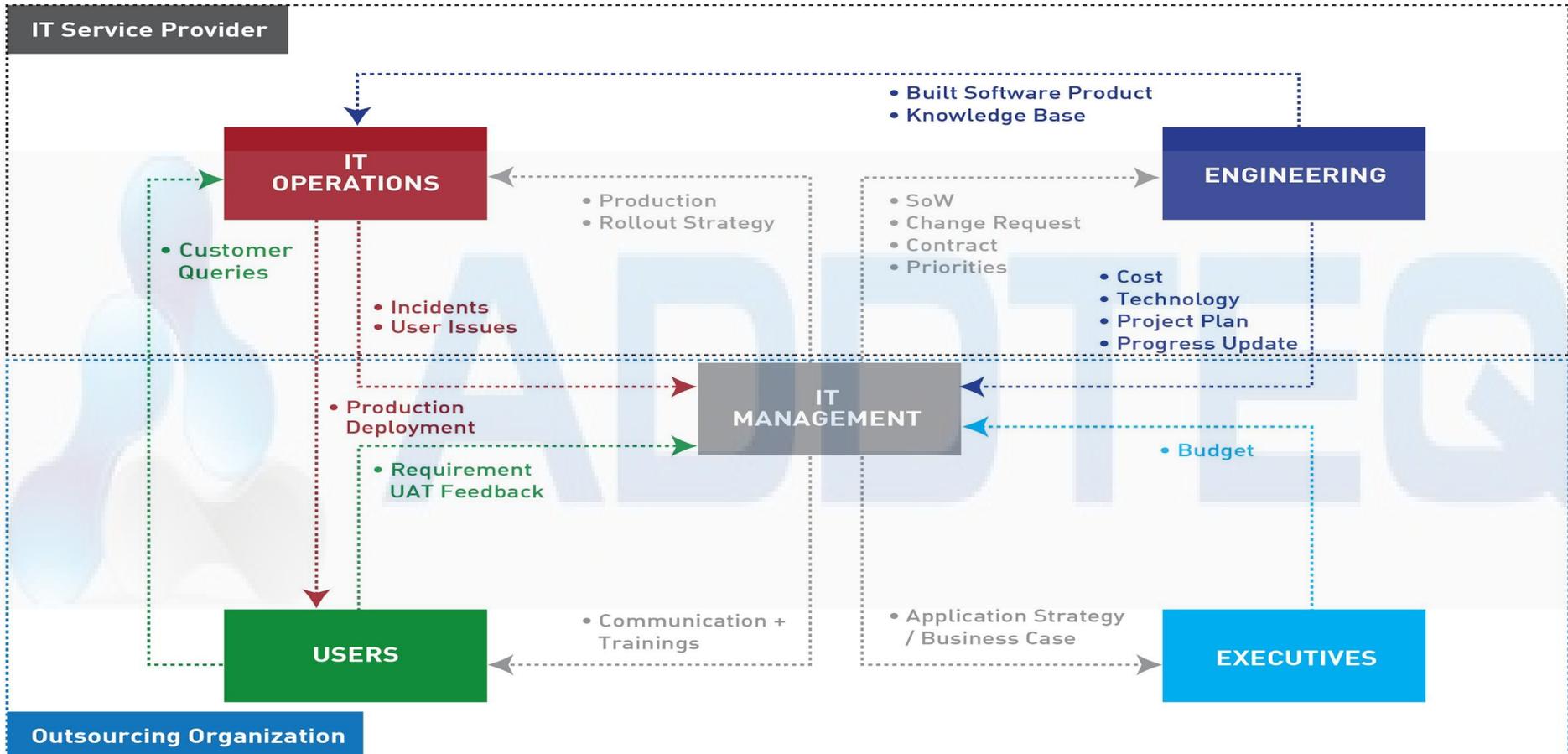
- Project gets created when Business / PfM approves a Feature, Release Version..
- For a product (features, release trains..) there could be multiple projects running in parallel internally..
- Also there could be multiple product versions released to market which need to be supported
- Teams in IT Service companies may get exposure only at project level
- Teams in product companies get exposure to product's cross functional teams.



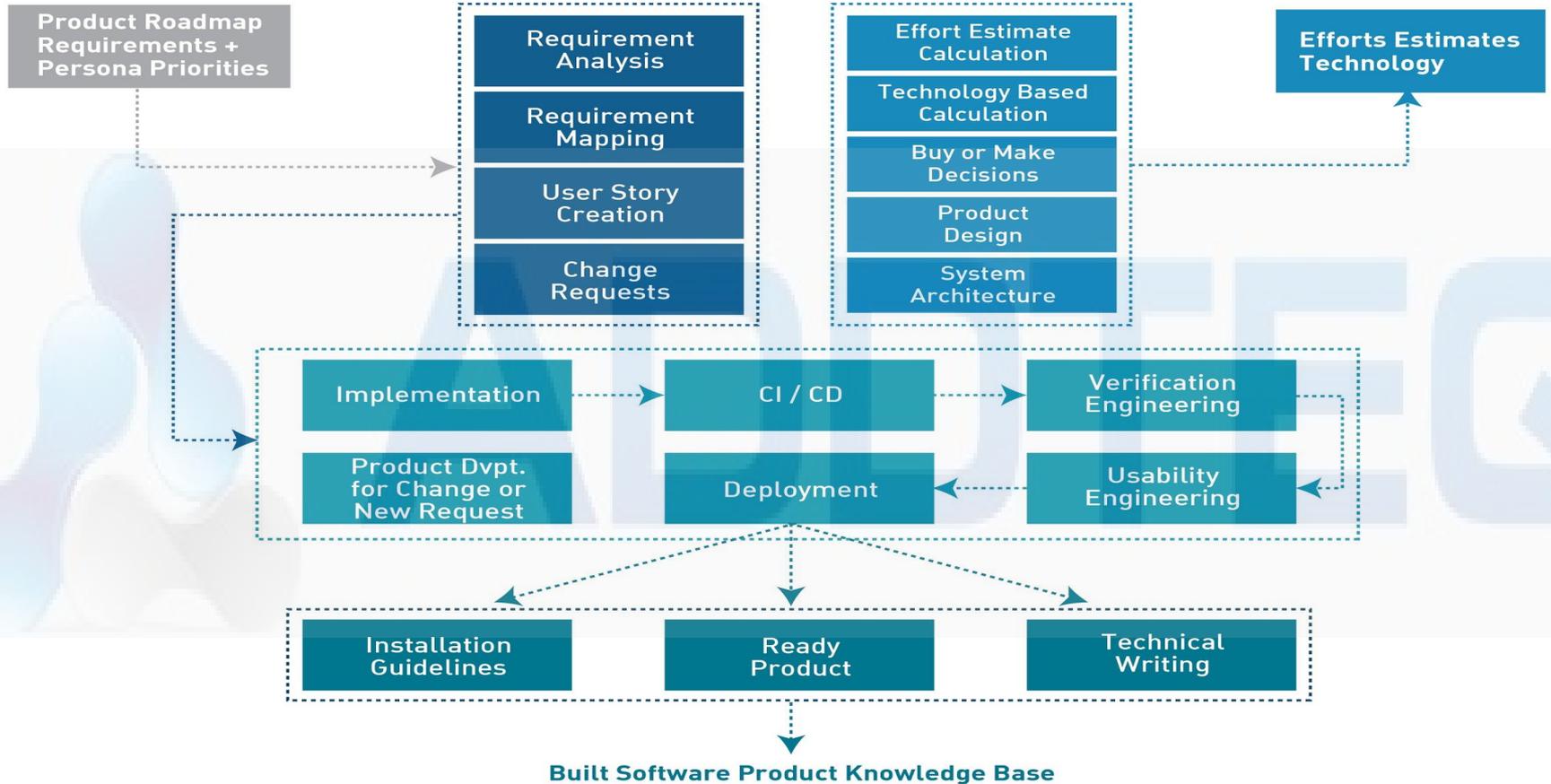
Product Organization Functions



Service Provider Organization Functions



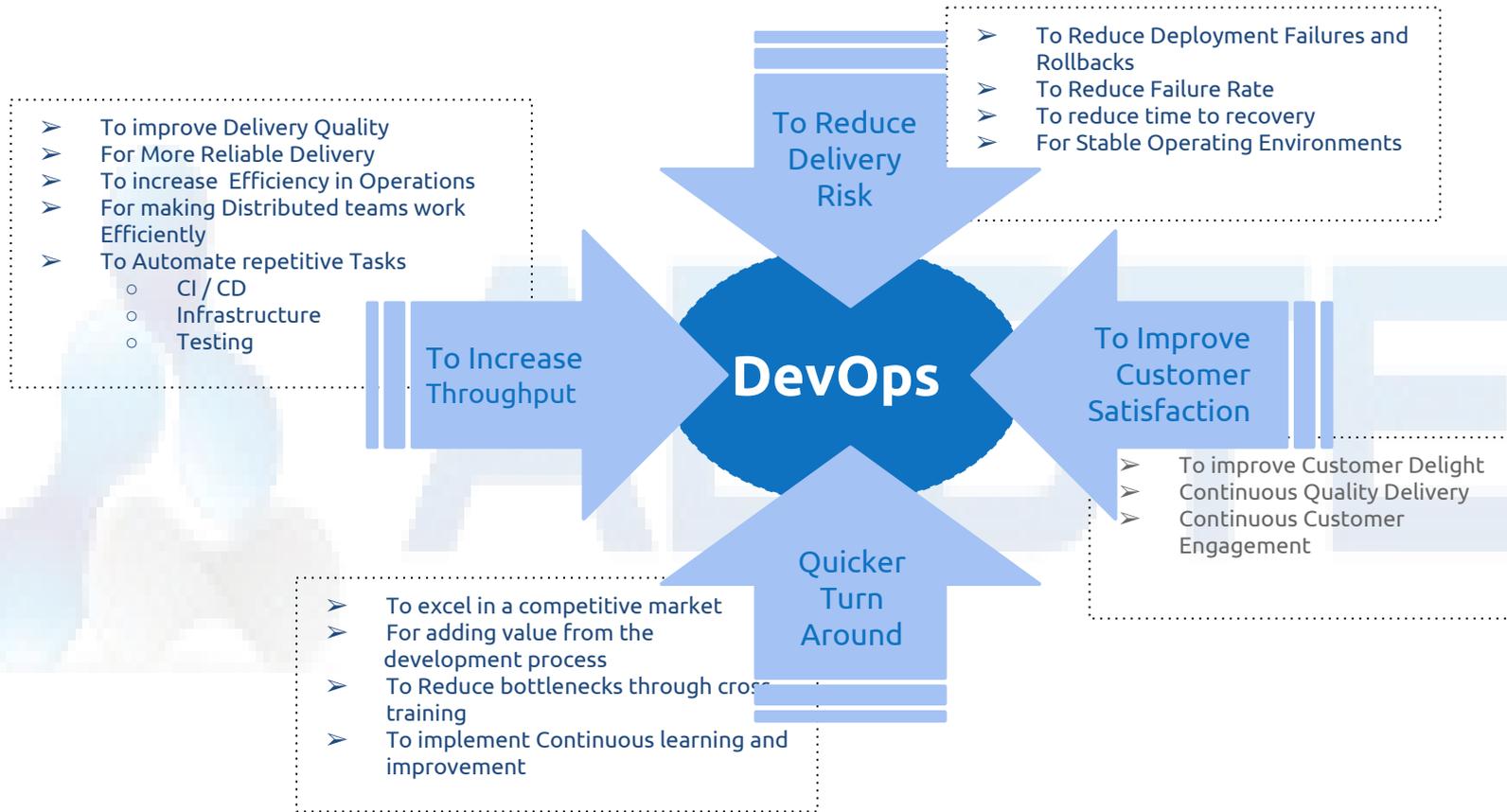
Software Development



Changing Environment for Products..

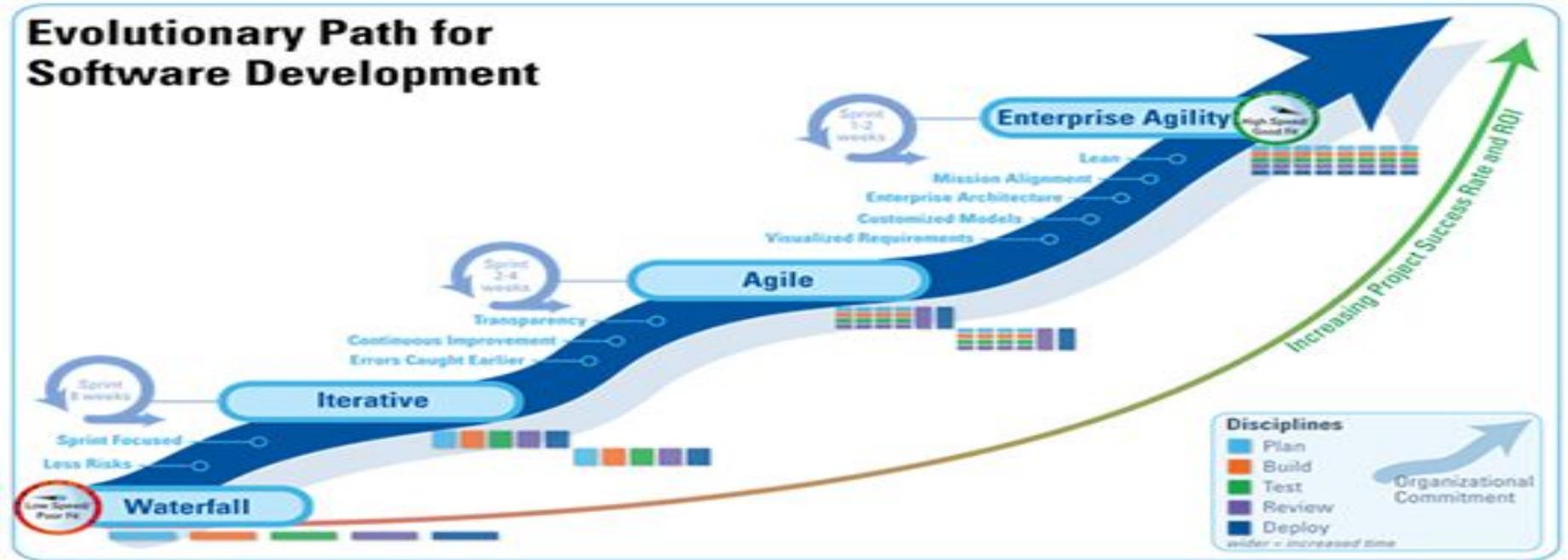
- Increasing Customer Expectations - frequent features but quality
- Multiple platforms to be supported
 - MAC, Linux, Windows Servers..
 - Different form factors (mobile, tablets, desktops..)
 - Different browsers
- Large Legacy of product code & features; not many know about old components
- Large / complex cross functional product teams
- Geographically distributed Teams
- Development pushing agility while operation teams want stability

DevOps Triggers



- Why DevOps?
- **What is DevOps?**
- DevOps Technology Overview
 - ALM
 - CI + CD
 - Infrastructure Management & Automation
 - Continuous Monitoring
- How to Adopt DevOps
 - DevOps Maturity Model
 - DevOps Adoption Model

What is DevOps?

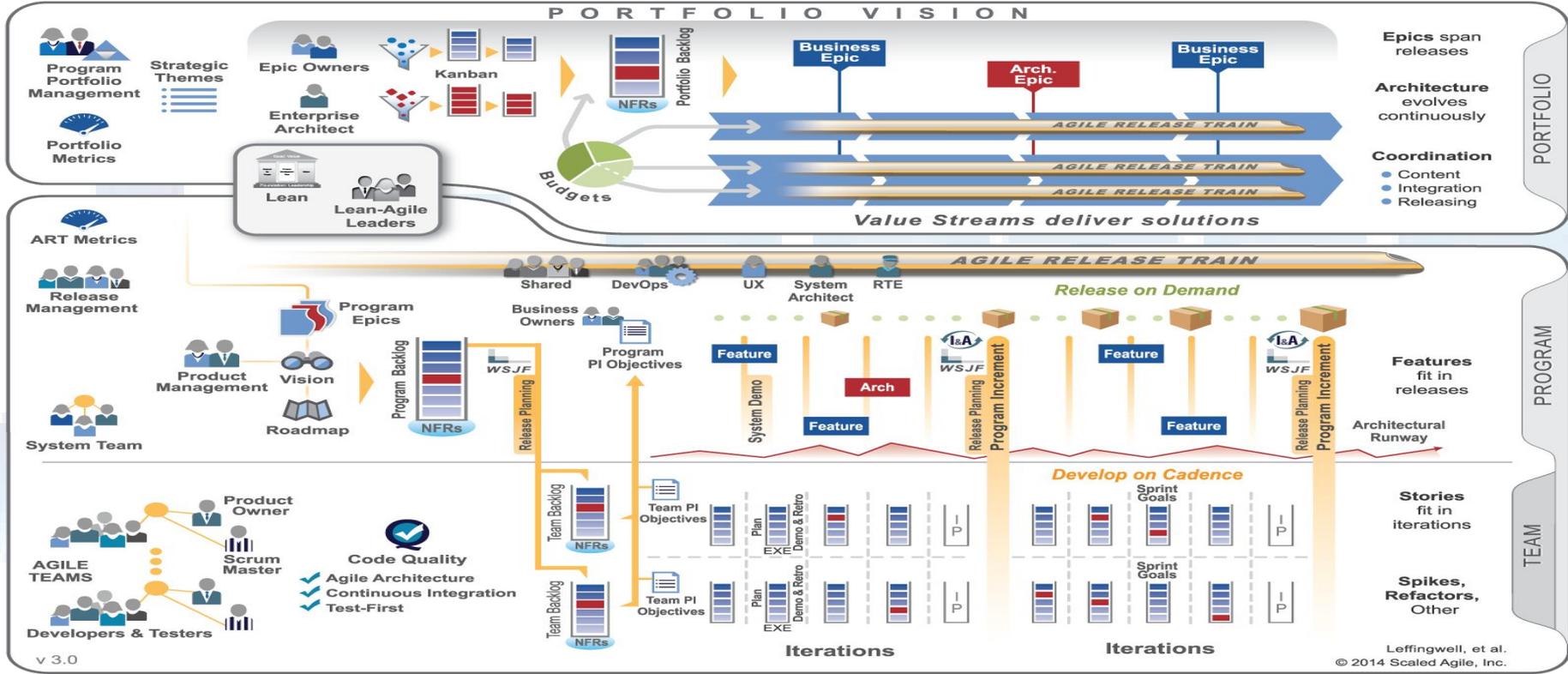


- Enterprise Agility emphasizes on keeping WIP/ Inventory low and go to production ASAP. Agile Scrum + Automation of CI + CD + Testing only can enable this.

Note : **Effective WIP** is subjective to organization

Whats is DevOps? (SAFe perspective)

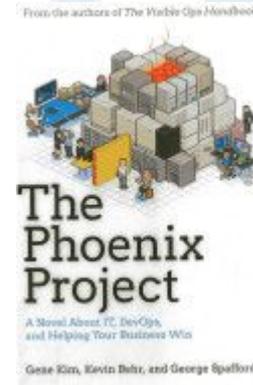
Scaled Agile Framework®



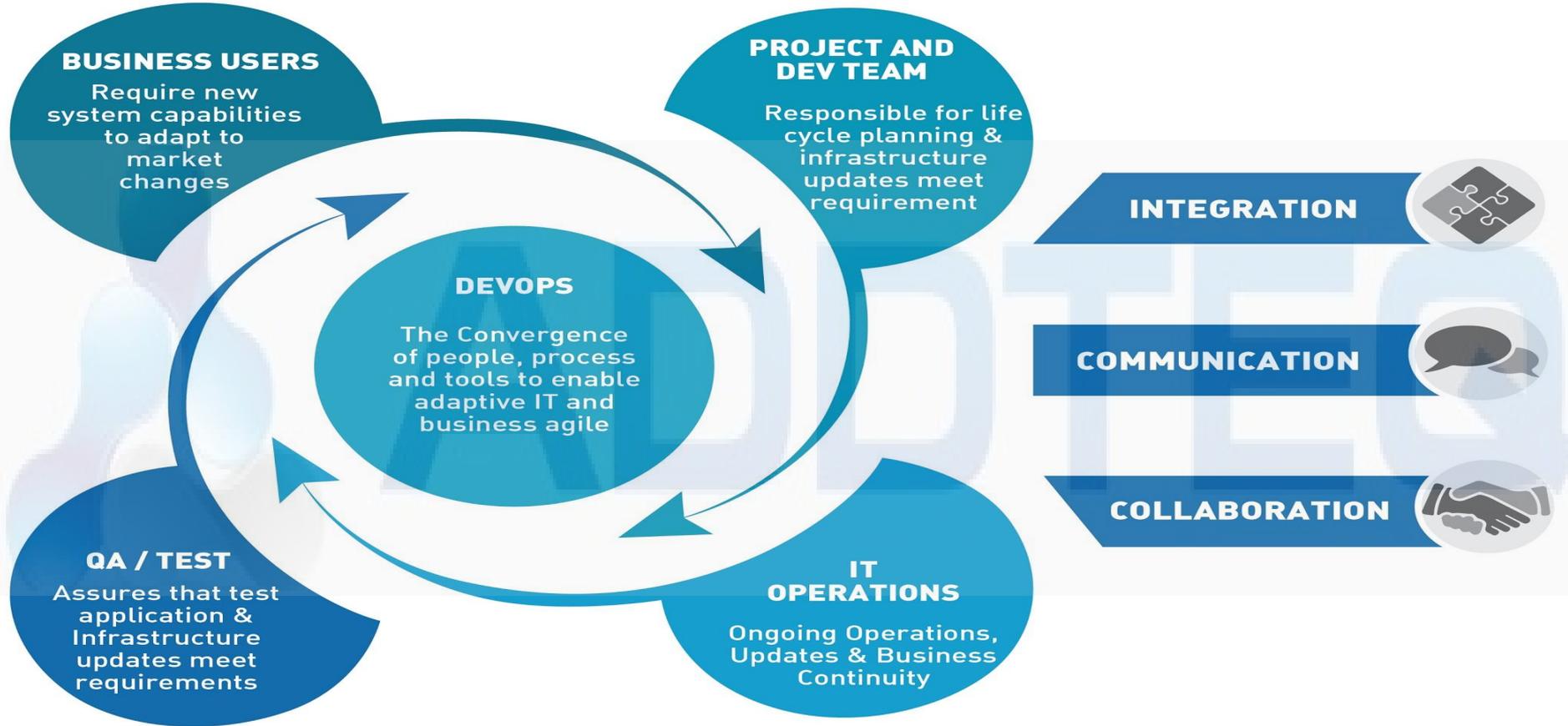
v 3.0

What is DevOps? Operational Aspect..

- See the big picture
- Focus on the flow
- Timely addressal of Operational Issues
- Look for Improvement opportunities



What is DevOps



Pillars of DevOps

Culture

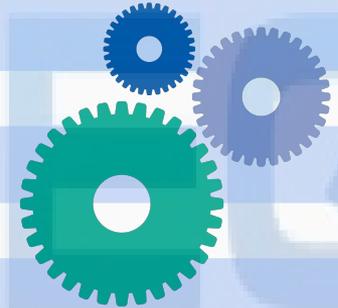
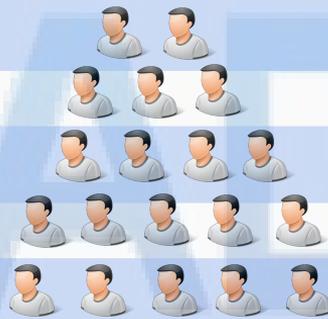
Technology

Process

Integration

Collaboration

Communication



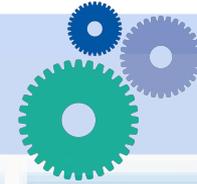
Integration

Culture

Technology

Process

Integration



- One team, one Goal
- Collective Decision Making
- Empowered Teams
- Healthy attitude about failure

- Integrated Req, Dev, Test, Deploy tools
- Integrated Infrastructure Management
- Traceability
- Integrated Dashboards n Metrics

- Cross functional processes & Workflows
- Automation of repetitive operations

Collaboration

Collaboration

Culture



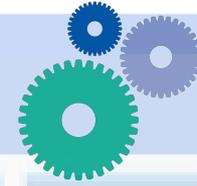
- Every perspective is important
- Collaborate early in the cycle
- Periodic Reviews
- Event Driven Reviews

Technology



- Collaboration tools on Code, Documents, binaries, Infrastructure, Reports
- Configuration Management for collaboration artefacts.
- Collaboration tools for distributed teams
- Integrated Signoff

Process



- Defined Review process
- Defined Approval Process

Communication

Communication

Culture



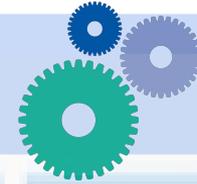
- Open flow of information - top down & bottoms up - phone, email, system, IM...
- Periodic Communication
- Event Driven Communication

Technology



- Centralised system where all information is collected.
- Automatic notifications to impacted parties
- Instant Messaging
- Automated Dashboards / Reports to keep everyone in sync

Process



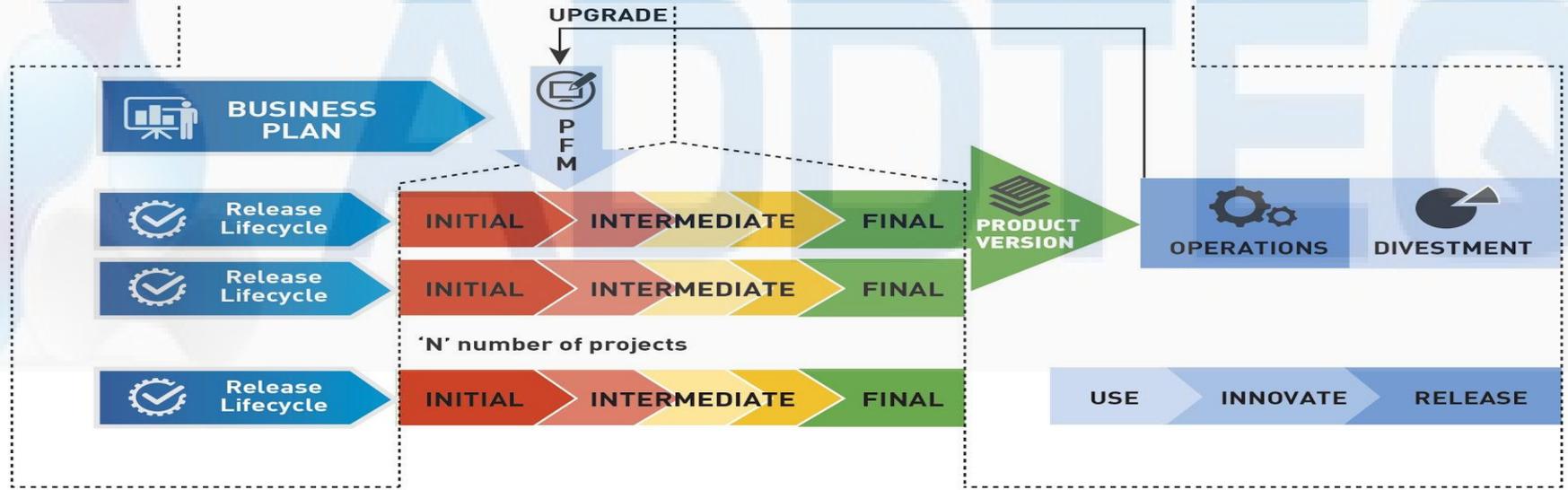
- Defined measurement system for progress, metrics .
- Defined communication & operating mechanism
- Defined Escalation mechanism

Agenda

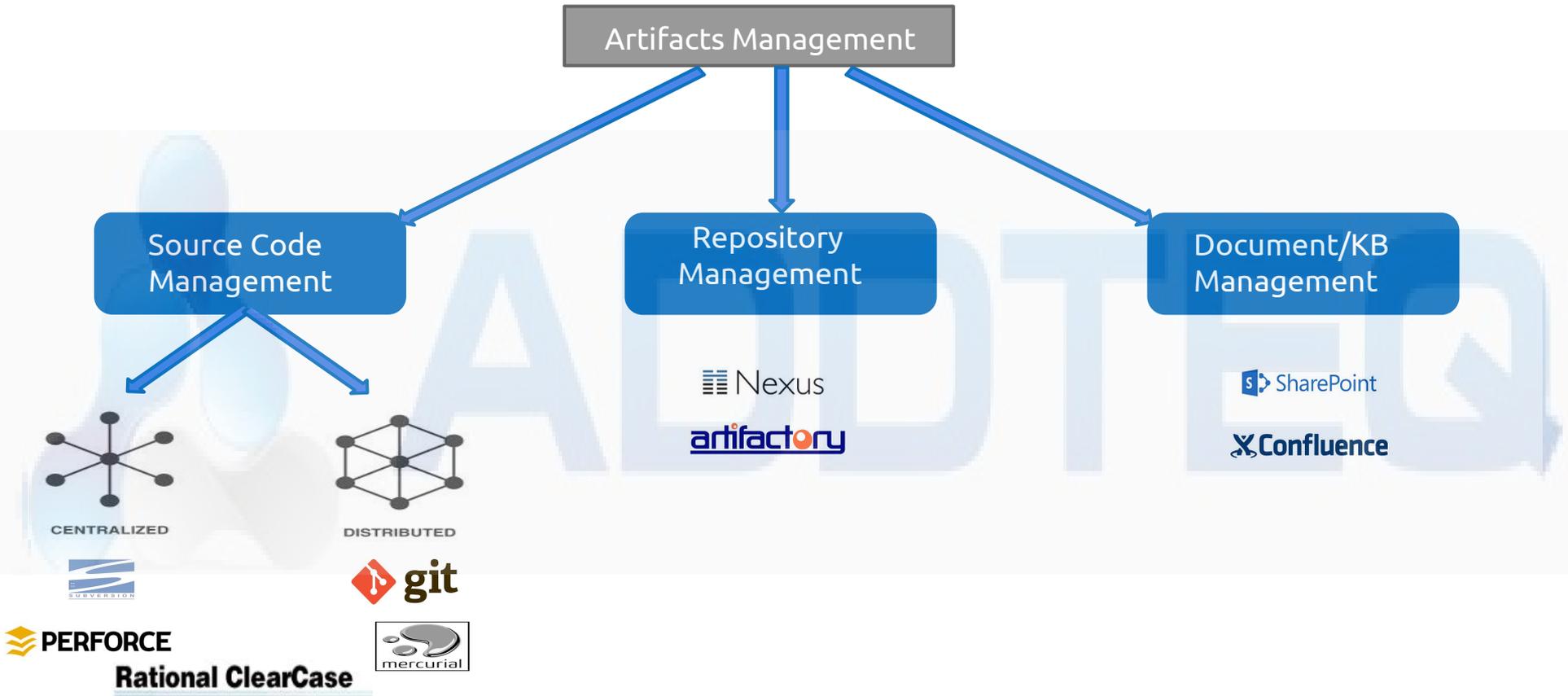
- Why DevOps?
- What is DevOps? Multiple perspectives
- **DevOps Technology Overview**
 - ALM
 - CI + CD
 - Infrastructure Management & Automation
 - ALM as DevOps Platform
- How to Adopt DevOps
 - DevOps Maturity Model
 - DevOps Adoption Model

Configuration Management

- Configuration Management
 - the process by which all artifacts relevant to your project, and the relationships between them, are stored, retrieved, uniquely identified, and modified
 - Change is constant and artifacts will be changing
 - Is it about keeping the inevitable change under control.



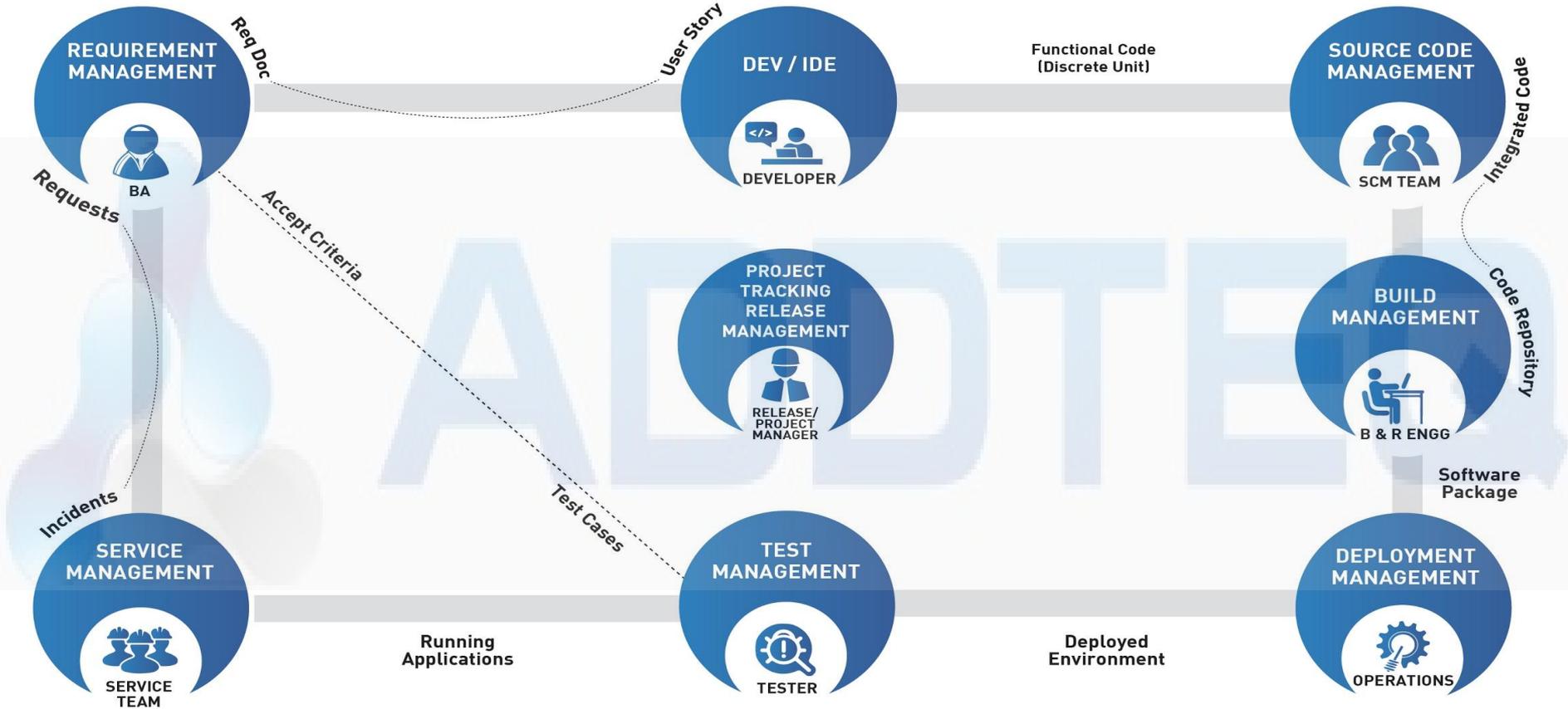
Artifacts Management Classification



ALM Evolution

- Problems with Configuration Management
 - IT Operations focused
 - Traceability (Requirement to Delivery) is very tedious
 - Visibility was not there
 - Collaboration, Communication platform is not integrated
- Application lifecycle management (ALM)
 - is the supervision of a software application from its initial planning through retirement.
 - It also refers to how changes to an application are documented and tracked.
 - Covers complete SDLC

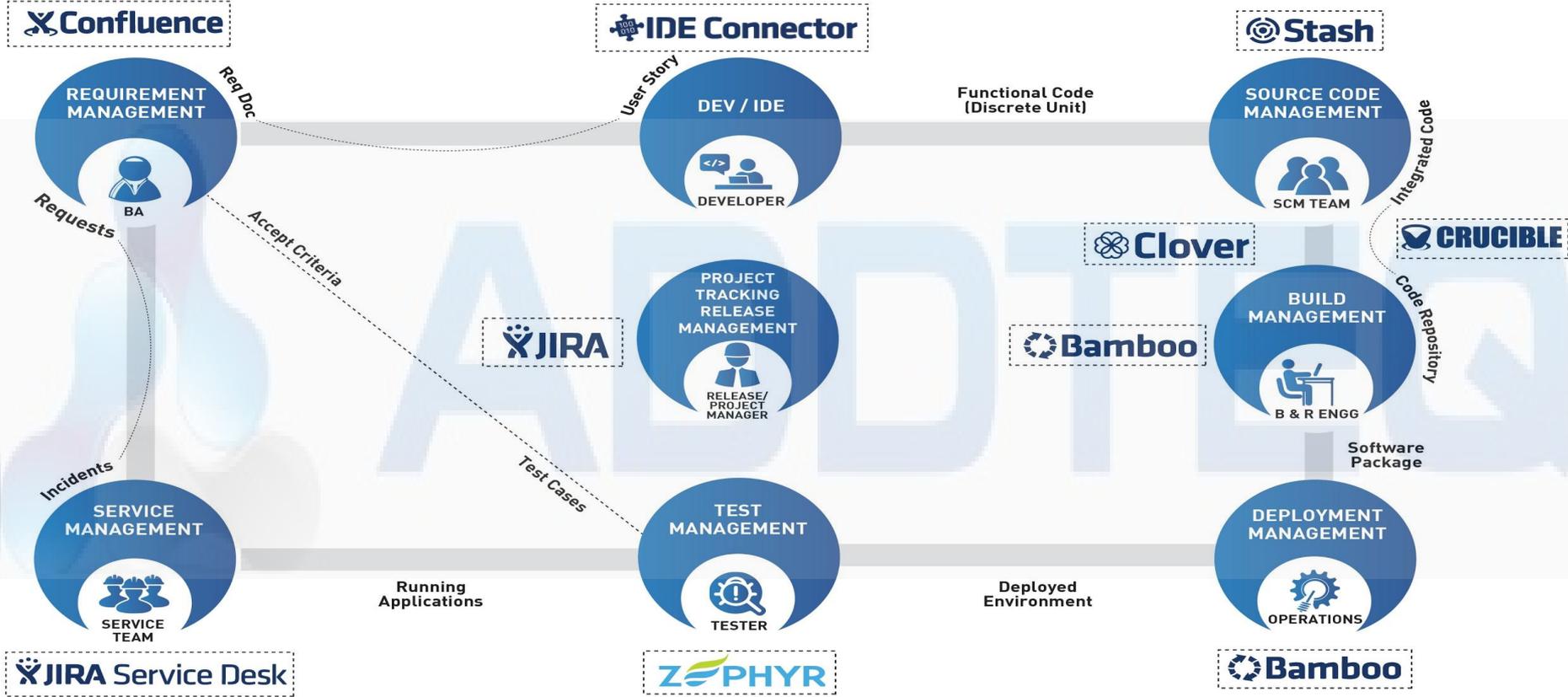
Application Lifecycle Management



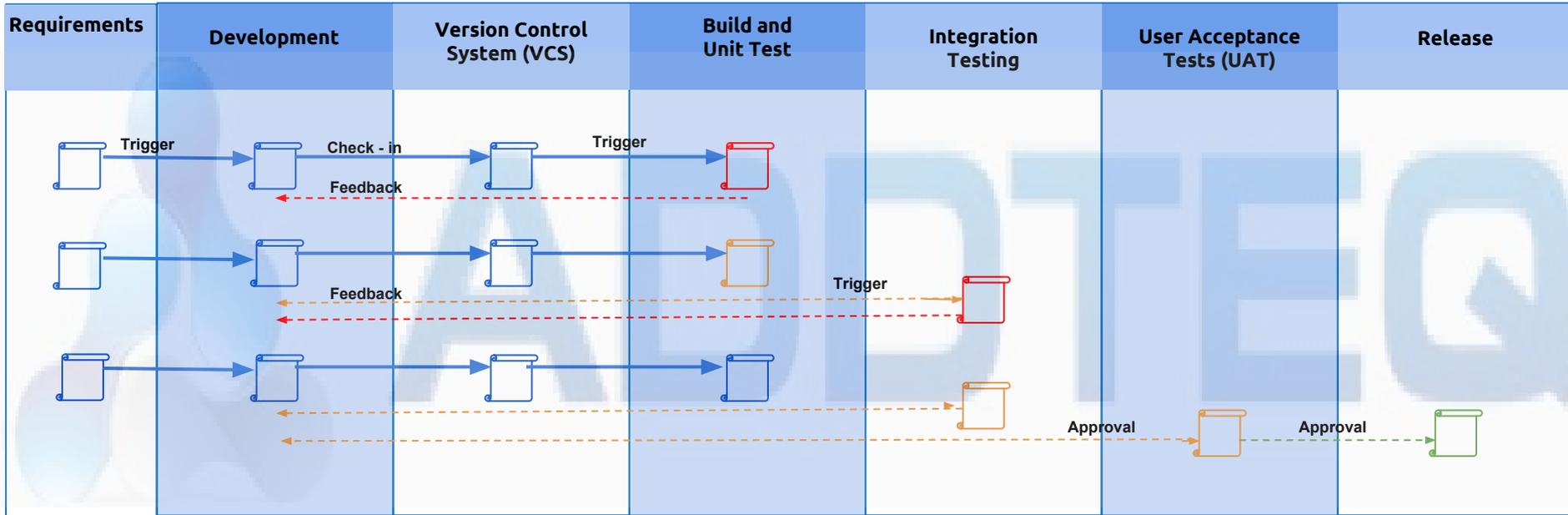
ALM Technology Providers and Toolsets

ALM Vendors	Products Offered
Atlassian	Jira,Confluence,Stash,Bamboo,Crucible,Jira Agile, Crowd,Fisheye,Bitbucket,SourceTree,
Serena Software	Development Manager, Requirement Manager,Release Manager, Service Manager, Agile Planner, Dashboard,Request Center, ChangeMan ZMF
Rally Software	Rally Product Manager, Rally Quality Manager, Rally Service Manager, Rally Portfolio Manager, Rally Idea Manager, Rally Community Manager
Microsoft	Microsoft Visual Studio, TFS
HP	HP Application Lifecycle Management 11.5
IBM	Rational Collaborative Lifecycle,Management Solution,Rational RequirementsComposer, Rational Team Concert,Rational Quality Manager

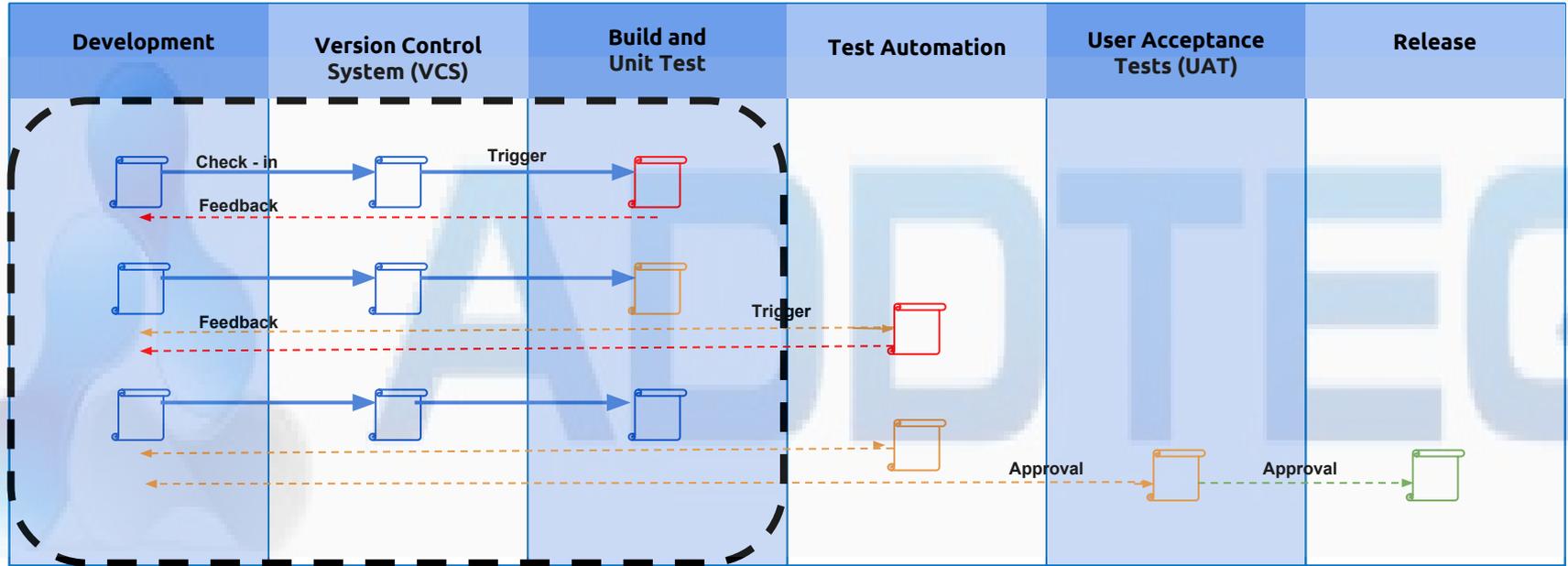
Atlassian ALM



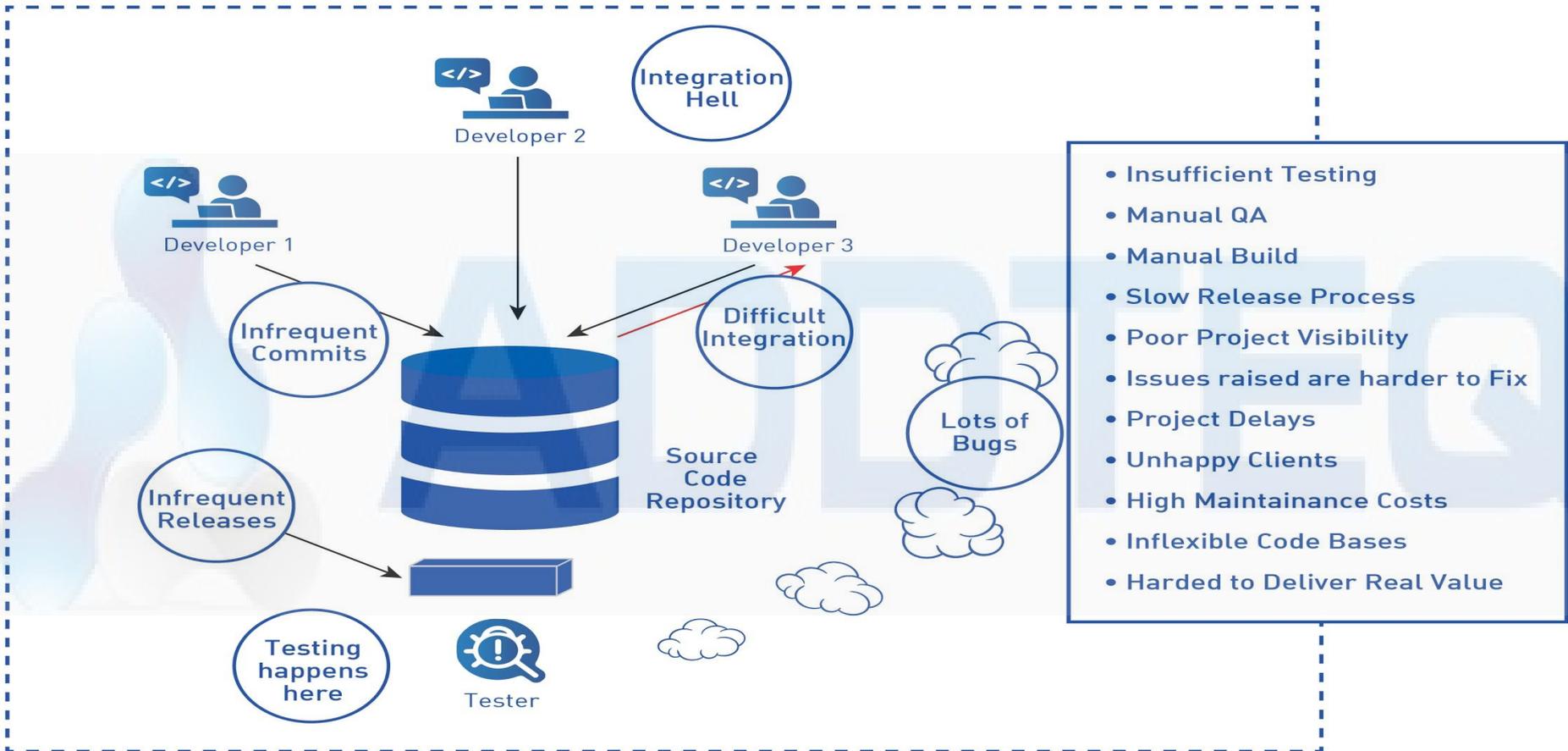
SDLC



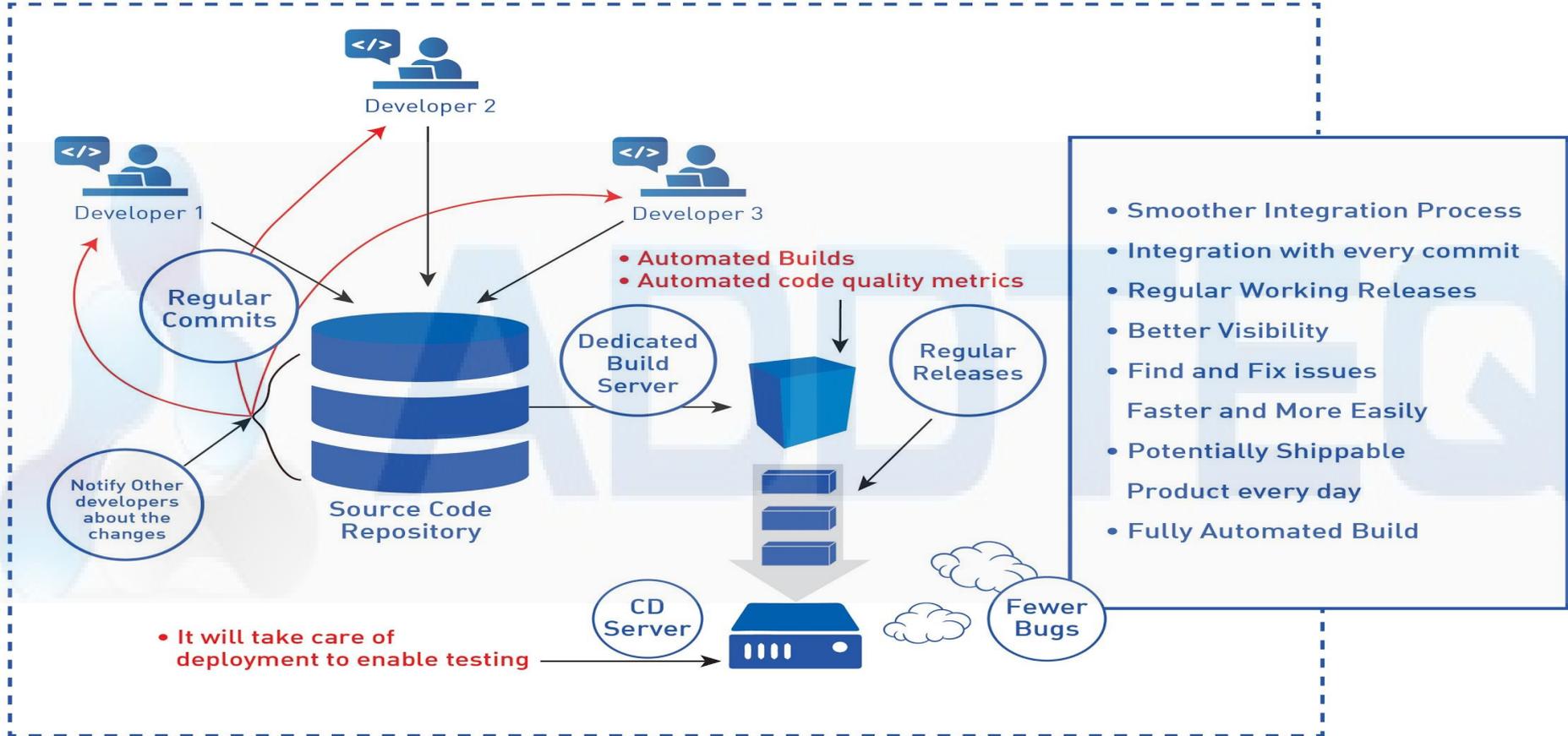
Continuous Integration



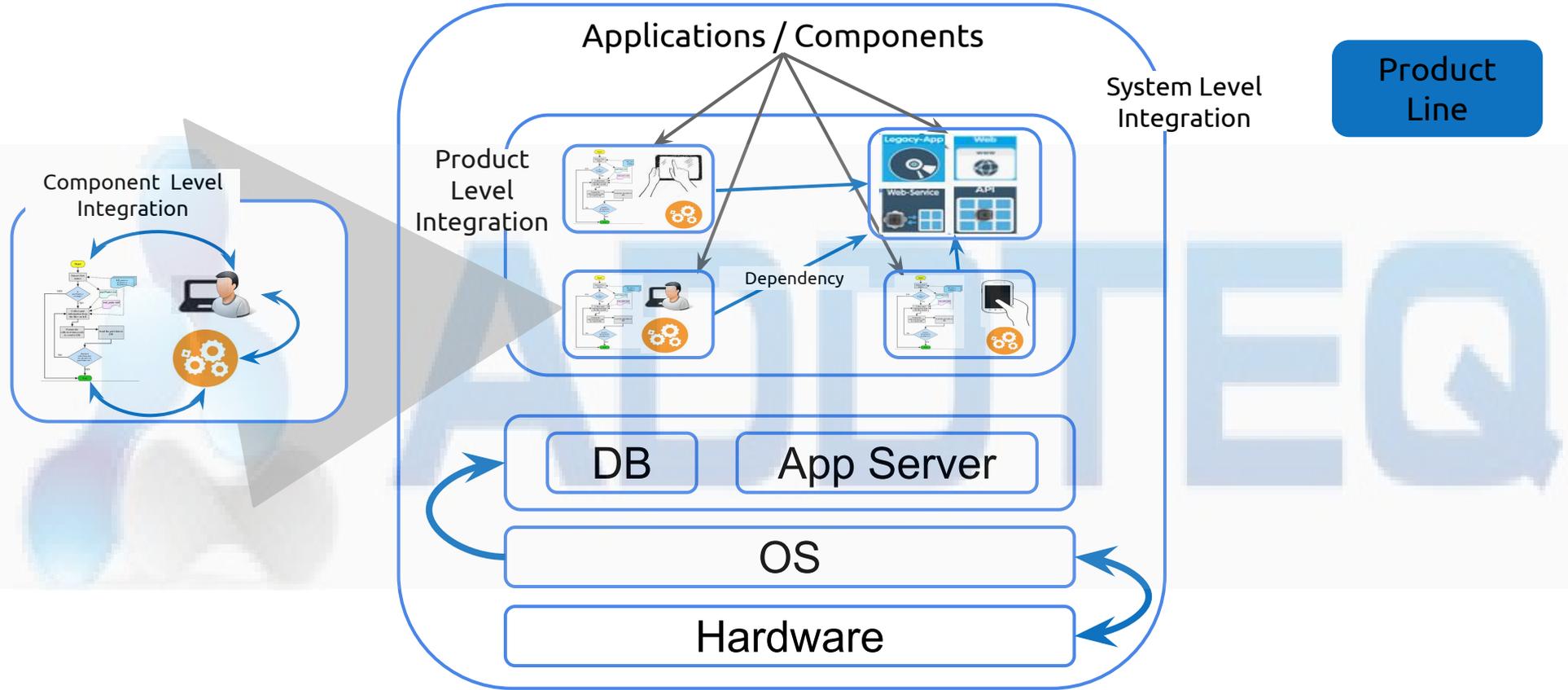
Before CI



After CI



Levels Of CI



CI tools available in market

Open Source Tools



Jenkins

TC TeamCity



Travis CI

cruisecontrol.

Paid Tools

Bamboo

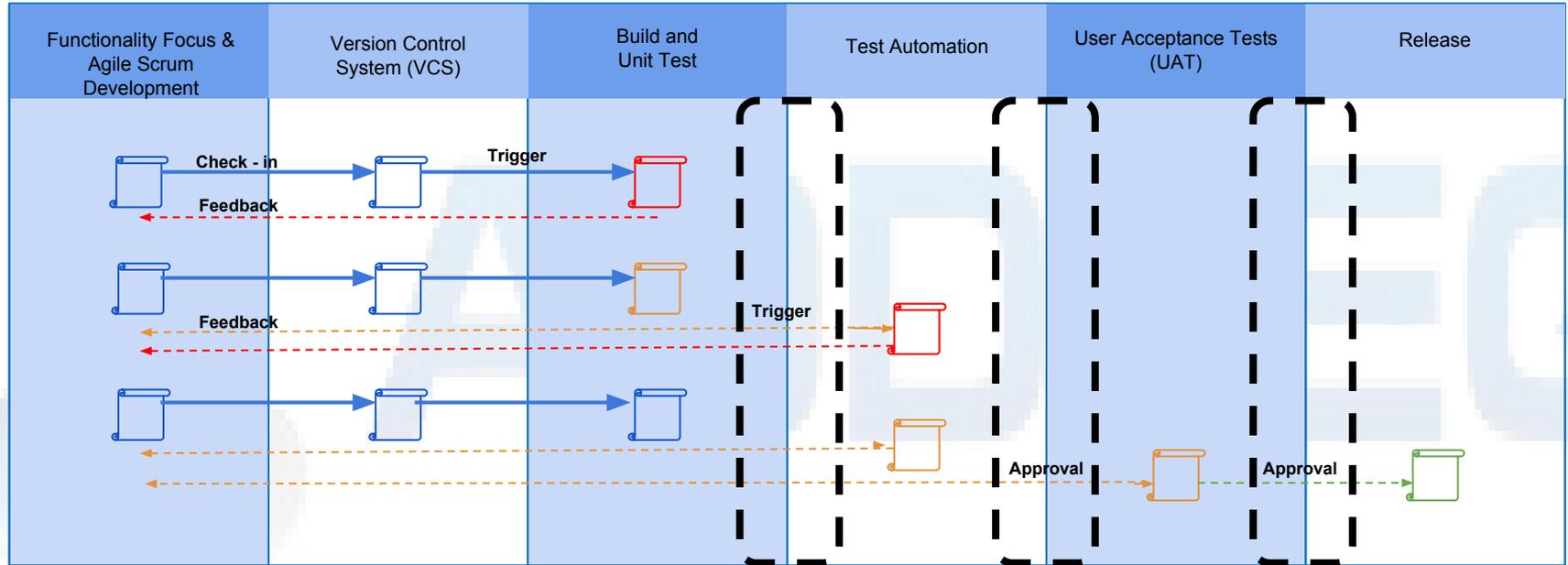
circleci

snap

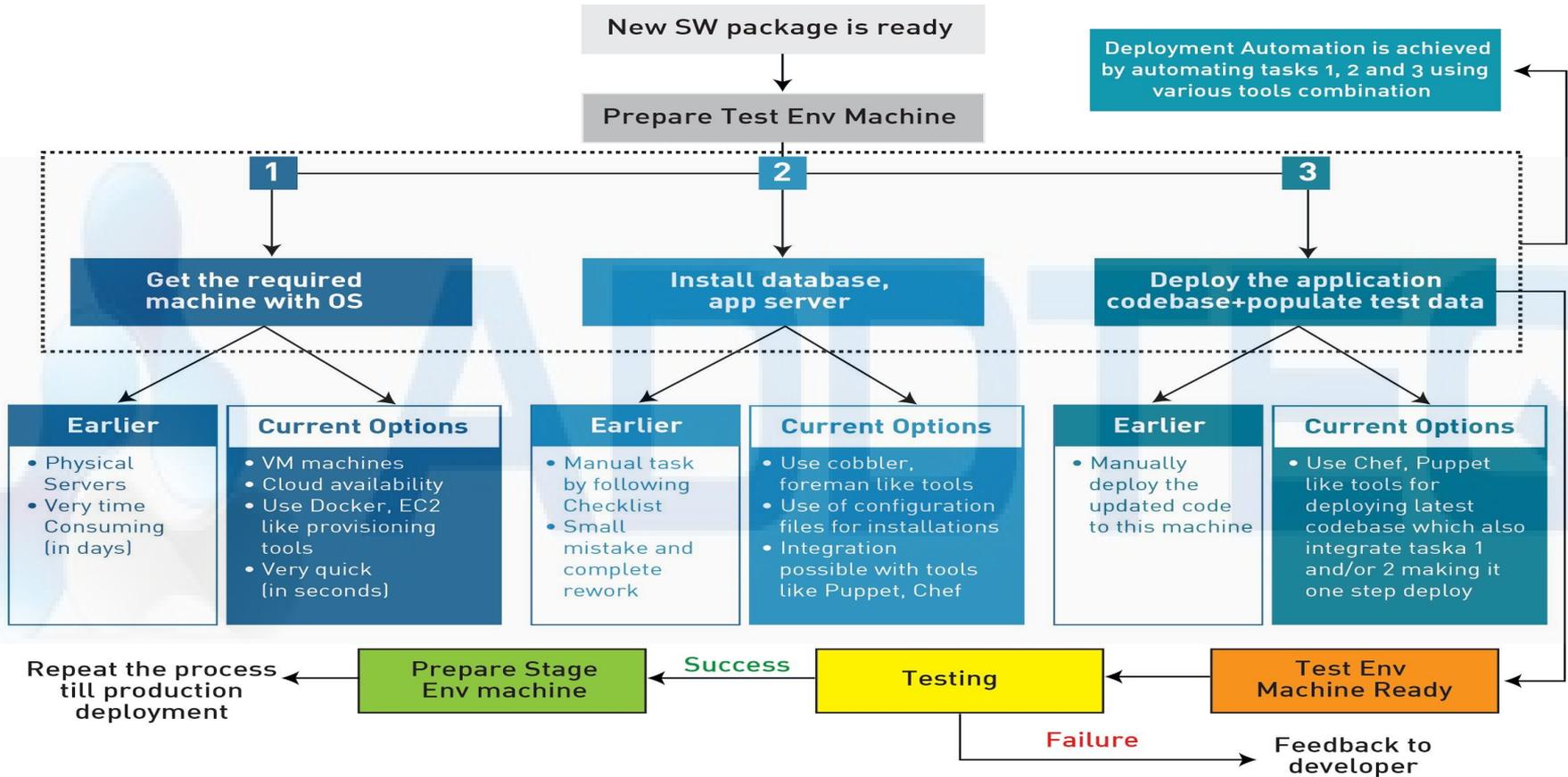
Factors to choose CI tools

	Jenkins	Bamboo	CruiseControl
VCS Support	Git, SVN, CVS	Subversion, Mercurial, Git, Perforce, CVS	CVS, PVCS, Subversion, ClearCase, Git
Build Tools	Maven, Ant	Ant, Maven, Make, Command Line, MSBuild	Ant, NAnt, Maven
Notification	Email, IRC, Google Talk, RSS, Twitter	Bamboo Wallboard, Email, HipChat, Google Talk, RSS	Email, Google Talk
Reporting	Rich, many plugins available for reporting purpose	Rich, many plugins available for reporting purpose	JSP and dashboard
GUI	Good	Very Good	Good
Static Code Analysis	Checkstyle, PMD, Findbugs, Compiler Warning, Clover, JUnit, TestNG, Cobertura	Checkmarx, Kalistick, Clover	PVS-Studio
Scalability	Easily scalable	Easily scalable	Easily scalable
Documentation	Poor	Good	Wider documentation
License	Free	Paid	Free
Integration	Integrates with Jira	Integrates well with Jira	Integration with Jira is possible

Continuous Deployment



Deployment Lifecycle



Continuous Deployment Tools

Infrastructure
Provisioning



Infrastructure
Automation



Configuration
Automation



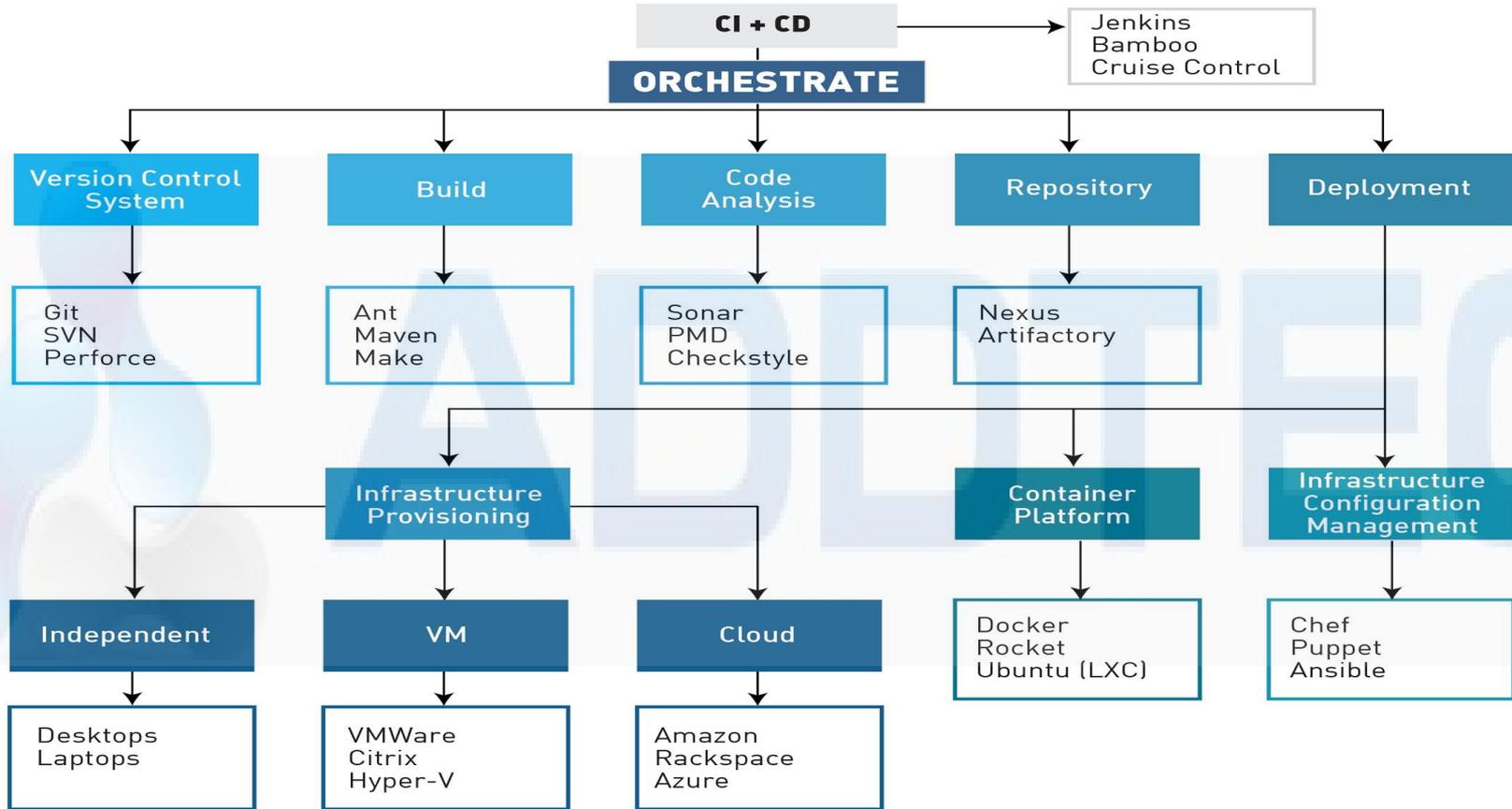
ANSIBLE



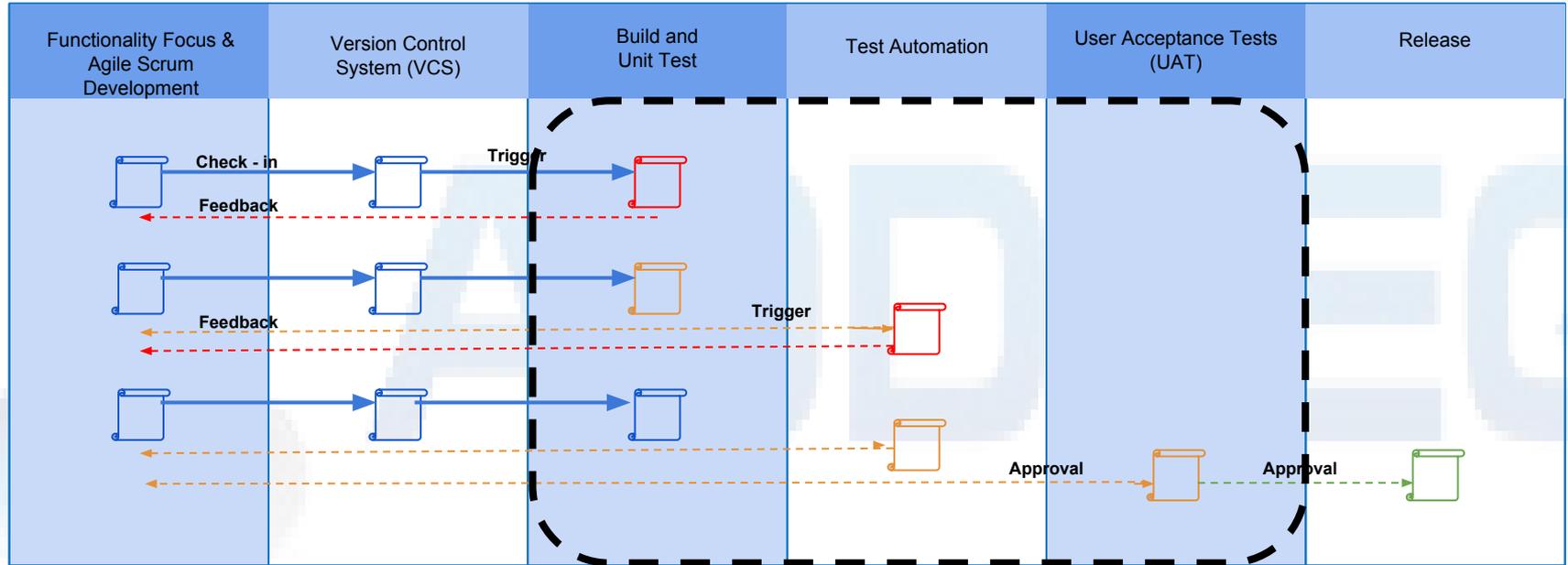
Factors to choose Infra CM tools..

	Puppet	Chef	Salt	Ansible
Timeline	-2005 -Next generation CM tool -Easier to configure and use compared to old player CFEngine -Uses Ruby-like DSL -Non-deterministic ordering	-2009 -Ruby like DSL -Mixes ops with development -Infrastructure as a Code	-2011 -Designed for remote execution Designed for speed, flexibility, ease of use, scale -Based on data, not DSLs	-2012 -No agent on remote machine -Ad hoc task execution -Simplicity in design
DSL ?	Yes	Yes	No	No
Push Or Pull	Pull	Pull	Push	Push
UI	UI is matured and handles reporting, inventorying and real-time node management	UI is very matured and provides many functionalities like inventory, view node activity etc	Not mature and even incomplete	UI is lacking and out of sync with CLI resulting in different results
Language	Ruby or Puppet specific subset of Ruby	Fully Ruby	YAML or complex Python or PyDSL scripts	Any language as long as it returns data in JSON format
Preferred Community	developers	developers	sysadmins	sysadmins
Simplicity and Ease of Use	-Learning curve is less imposing since it is model-driven -Difficult to configure	-Steep learning curve being procedural	-Difficult for newbies	-Extremely simple to set up and get running
Connection Protocol	SSH	SSH	SSH, info to minions is pushed using ZeroMQ	SSH
Setup And Installation	-Relatively simple -Installation of master server and client agents on each system to be managed -Installation process lacking in error checking and error reporting	-In addition to master server, workstation is required to control master -Agents can be installed from workstation using knife tool which uses SSH for deployment	-Can be installed through Git or through package management system on master and clients -Clients make a request of master server which when accepted on master allows that minion to be controlled	-Set up can be done through Git repository clone to an Ansible master server -Nodes to be managed are added to the Ansible configuration and SSH authorized keys are appended to each node Master communicates with nodes via SSH
Scalability and Speed	-Slow when there are 100s or more clients trying to get their catalog		-Quickly scalable, very resilient and efficient because of multi-master capability	
Maturity	-Most mature -Most approachable from usability point of view	-May appeal to corporations who place a premium on stability	-Salt execution and state module support is more mature	-Ansible execution and state module support is less mature
Platform	-Platform consists of MCollective, Hiera, and other open source projects to provide comprehensive automation -Supports all platforms	-Platform's inherent security is improved with Chef Vault -Supports all platforms	-Supports all platforms	-Control machines and Managed nodes both must have Python2.6 -Control machine must be Linux or Unix based and Managed nodes can be Windows or Linux or Unix based -No support for Windows
Documentation	Good documentation	Sometimes it is vague	Poorly organized, very dense and difficult to get started	Better than Salt, nicely organized and easy to get started

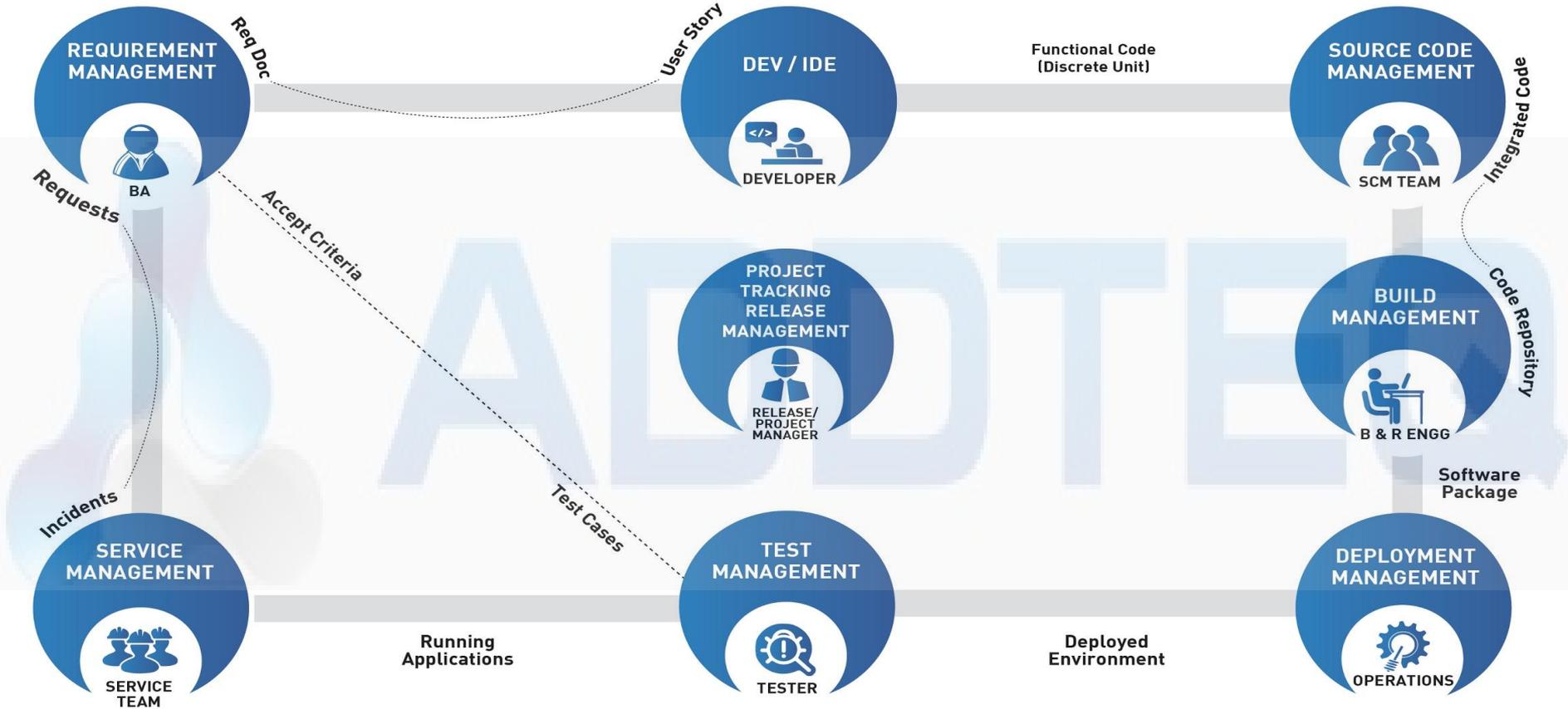
DevOps Engineering Tools



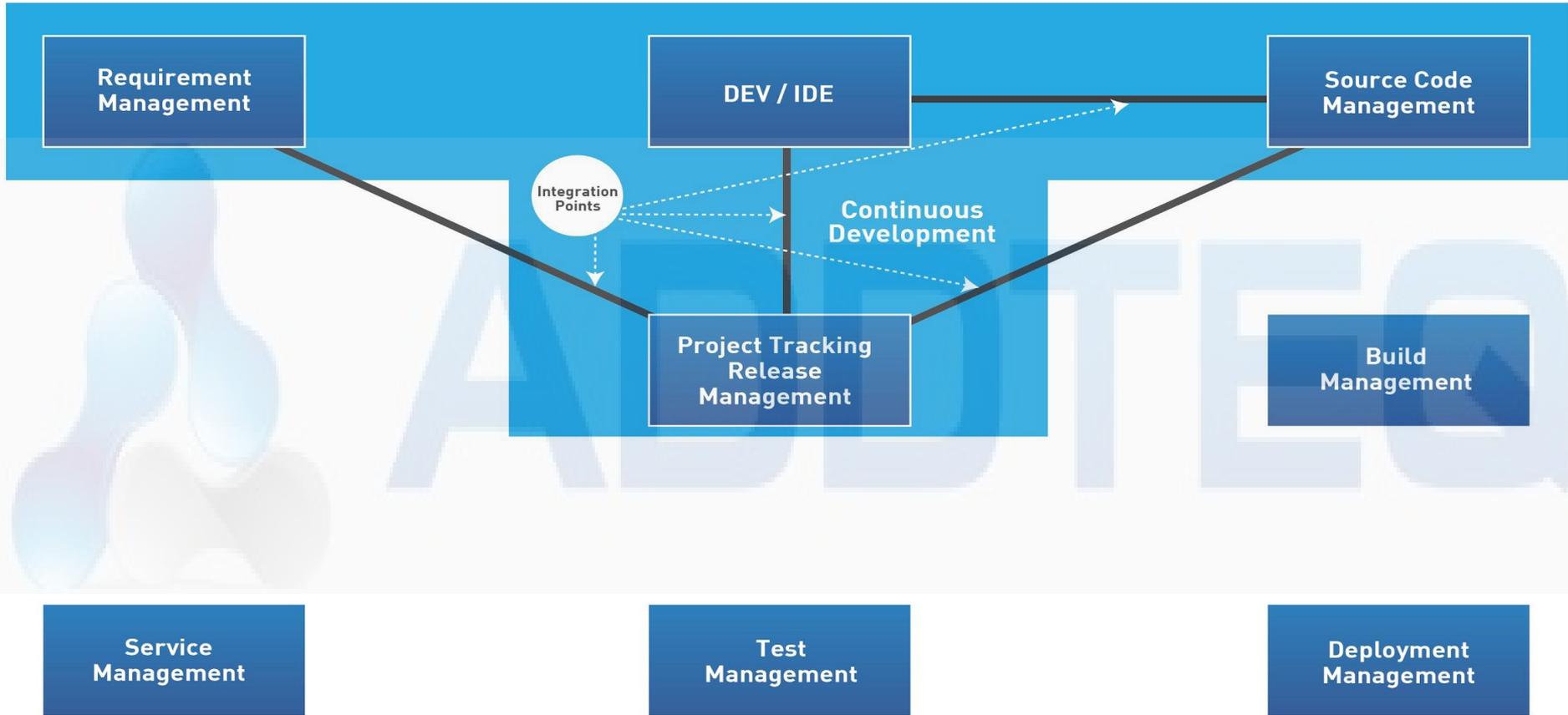
Continuous Quality



ALM as DevOps Platform?

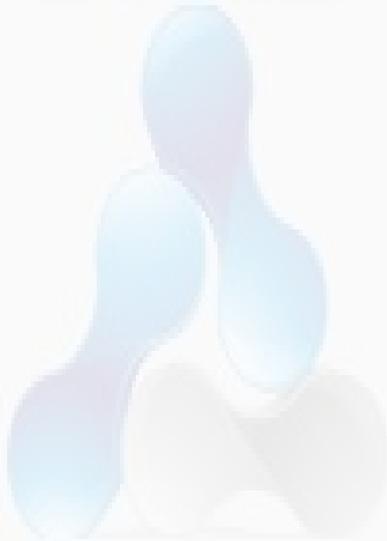


ALM for Development

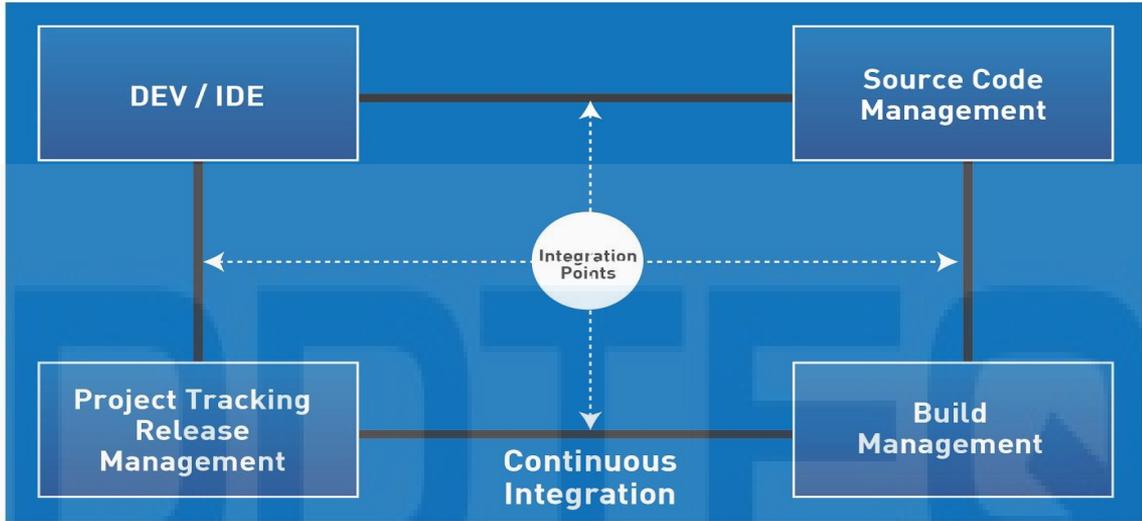


ALM for CI

Requirement Management



Service Management



Test Management

Deployment Management

ALM for CD

Requirement Management

DEV / IDE

Source Code Management

Project Tracking
Release Management

Continuous Deployment

Build Management

Integration Points

Service Management

Test Management

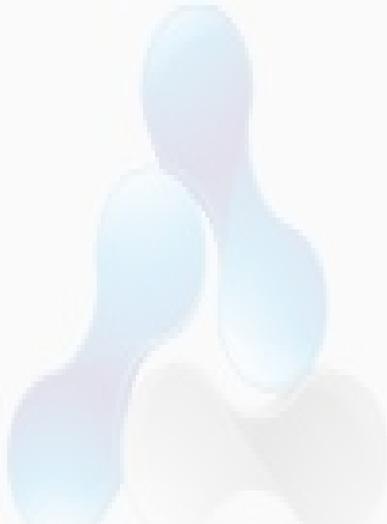
Deployment Management

ALM for Continuous Testing

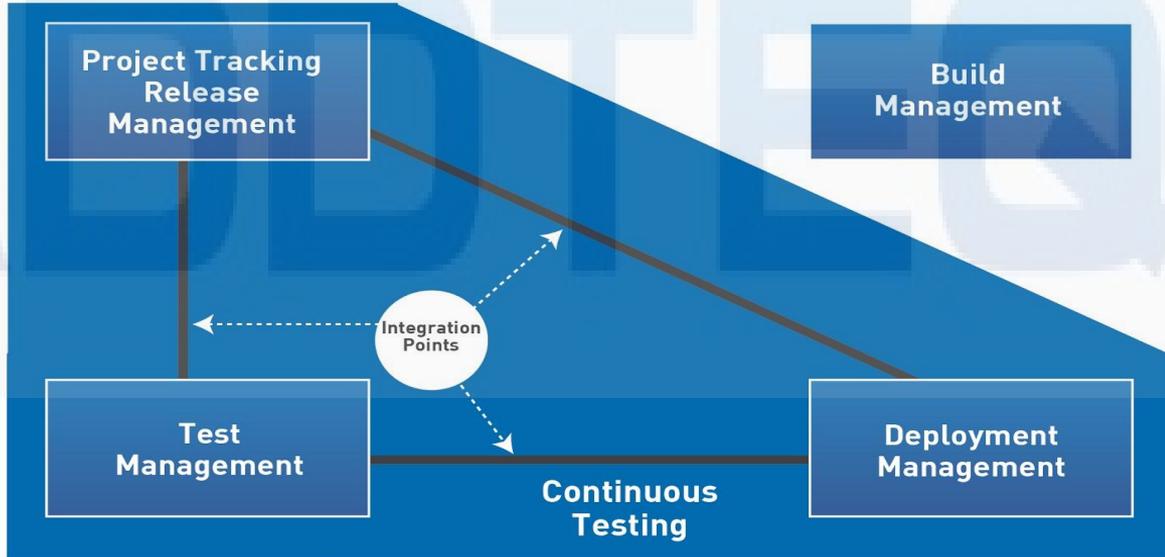
Requirement Management

DEV / IDE

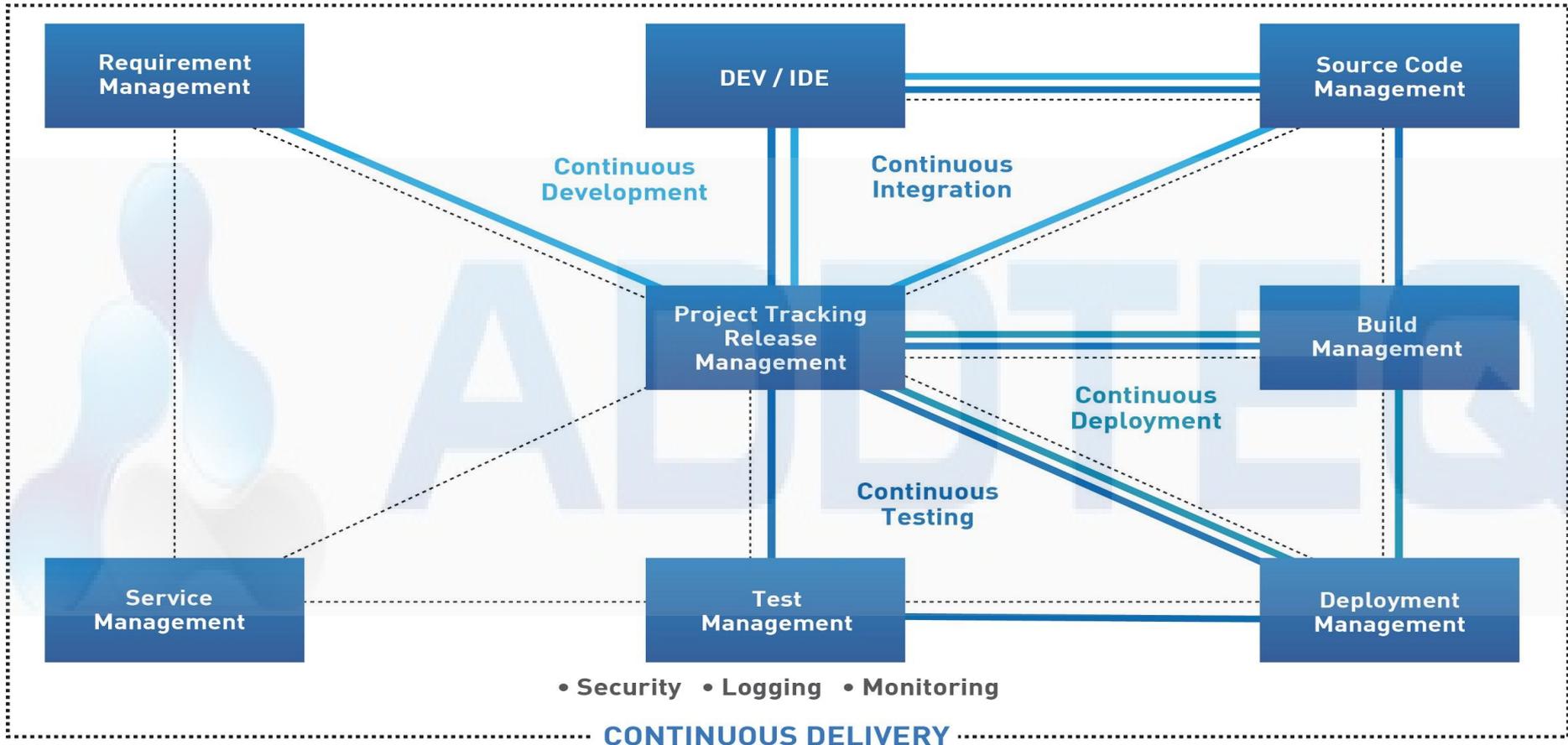
Source Code Management



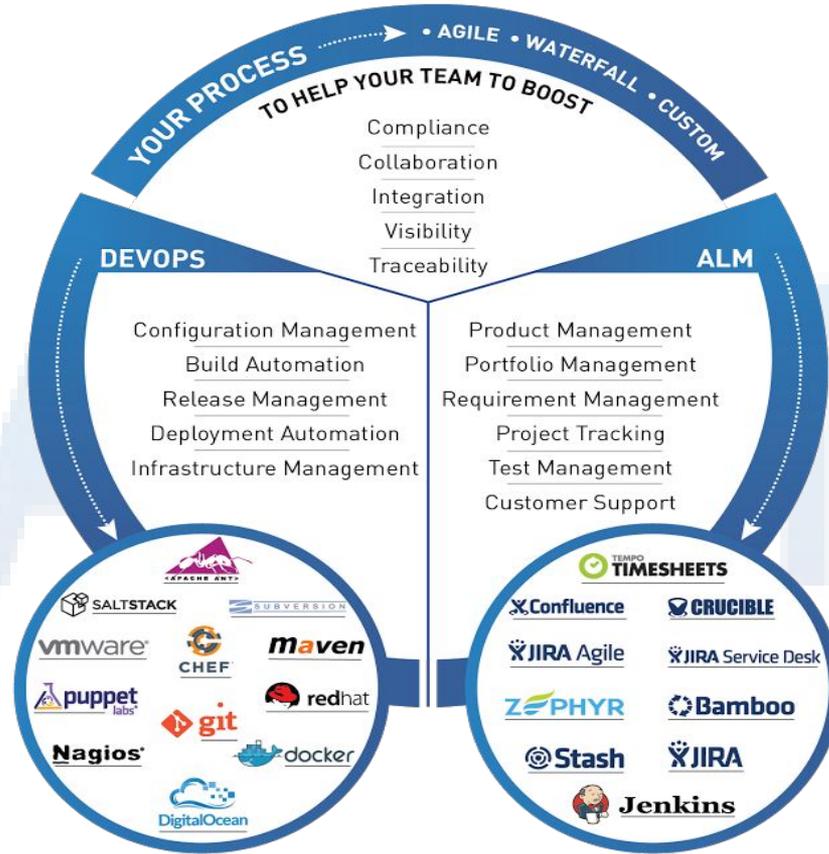
Service Management



Integrated ALM as DevOps Platform



DevOps Technology



Agenda

- Why DevOps?
- What is DevOps?
- DevOps Technology Overview
 - ALM
 - CI + CD
 - Infrastructure Management & Automation
 - ALM as DevOps Platform
- **How to Adopt DevOps**
 - DevOps Maturity Model
 - DevOps Adoption Model

Prescription for DevOps Adoption

- ★ Start with a business objective
- ★ Identify actions to fix pain points
- ★ Execute on the actions / measure results
- ★ Iterate for continuous improvement

ADDTEQ

DevOps Adoption Model

Delivering Change

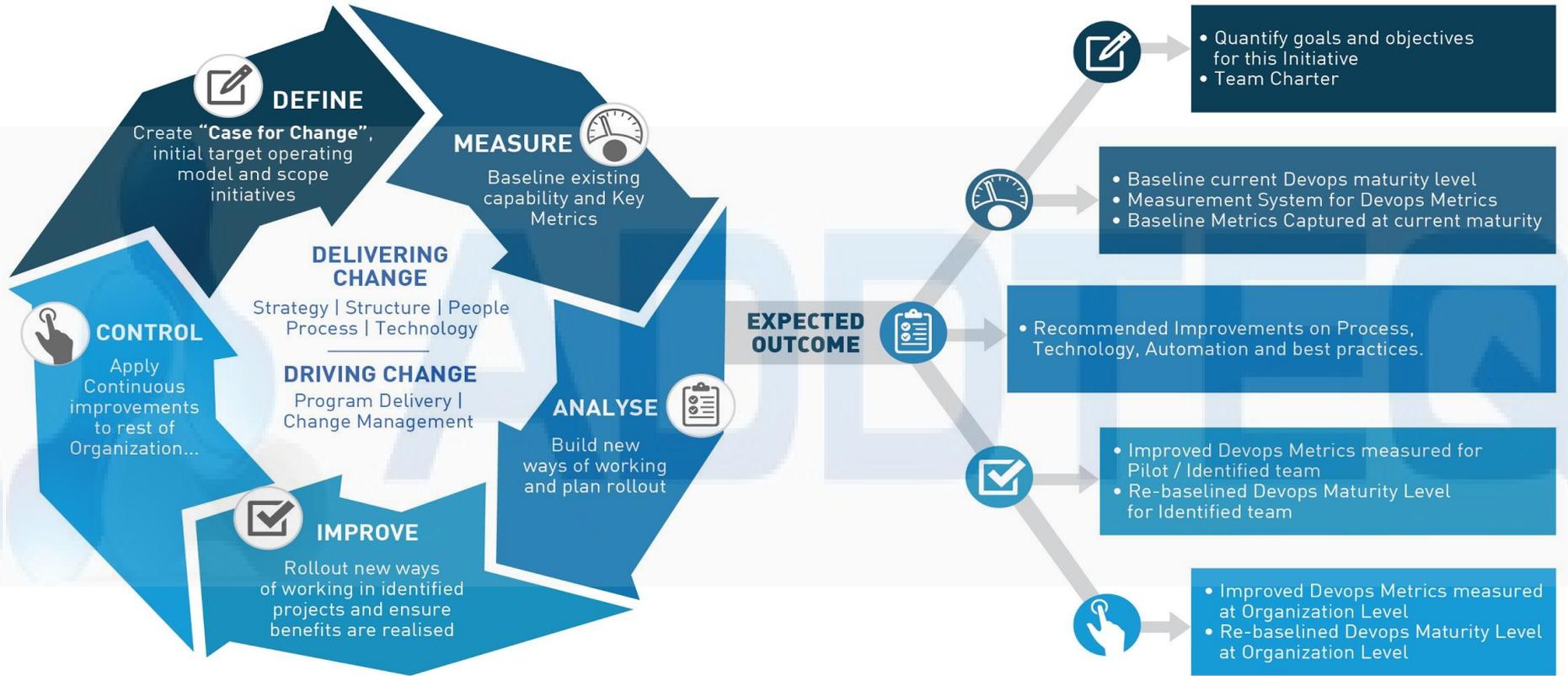
- Strategy
- Structure
- People
- Process
- Technology

Driving Change

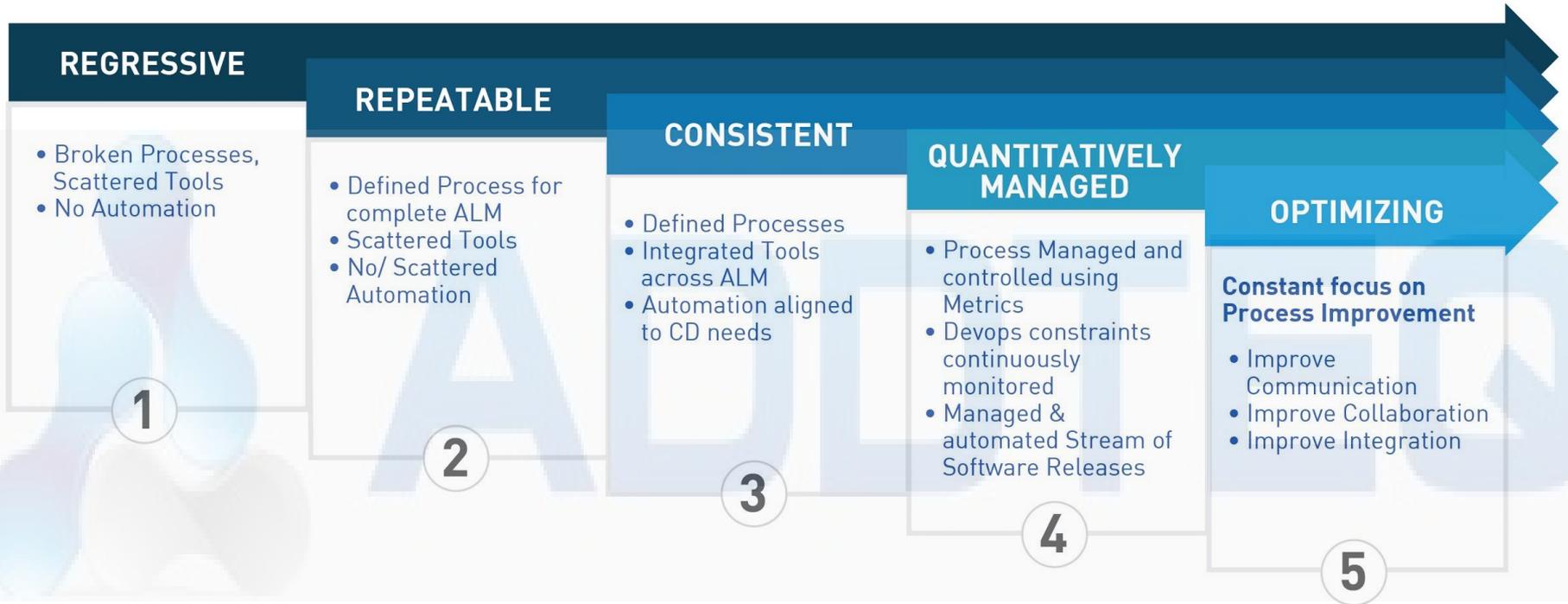
- Program Delivery
- Change Management



DevOps Adoption Model

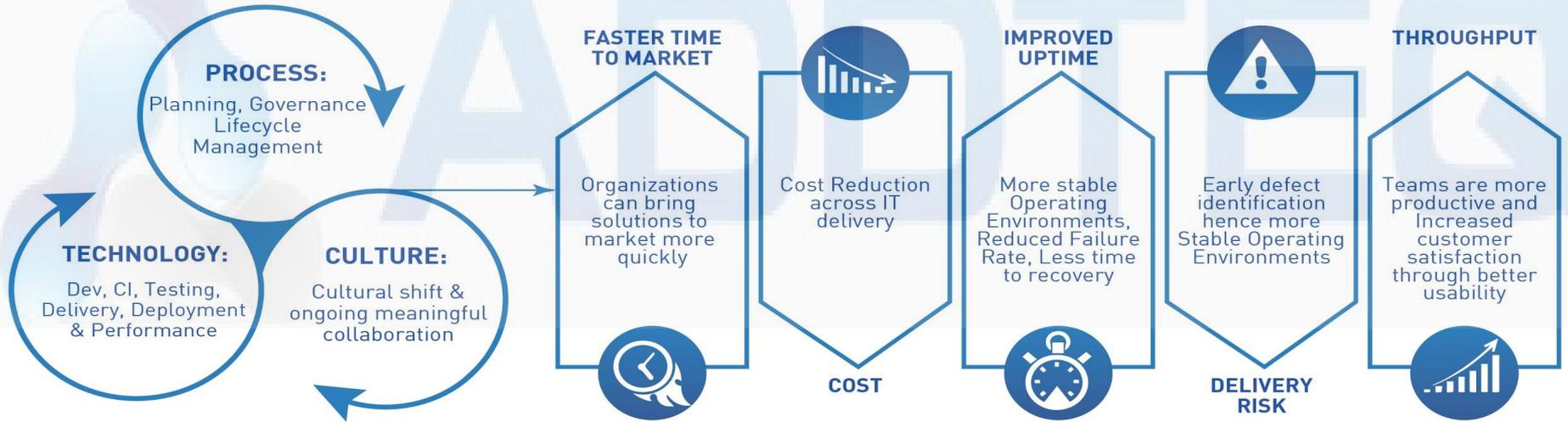


DevOps Maturity Model (Sample)



Last word...

DevOps represents a major cultural change, so keep your expectations in check. Don't expect the organization to change overnight and also to change the entire organization at the same time.



Addteq offerings around DevOps..

- ❖ 2 Day DevOps awareness workshop for Core Team
- ❖ 5 Days DevOps Assessments and Recommendations workshop with core team
- ❖ **DevOps Consulting in**
 - Cultural change management
 - Process Optimization
 - DevOps technology Implementation
- ❖ **DevOps Trainings**
 - Atlassian Suite training for Admins
 - GIT Training
 - JIRA Admin training
 - Stash & Bamboo Training
 - Jenkins Trainings
 - Puppet, Chef Trainings
 - DevOps Toolkit training (customized)

Thank You

Thanks for your kind attention and patience :)

Happy to network

<https://in.linkedin.com/in/kvudaykumar>



For detailed demos on some of Integration & Automated solutions, please refer to <https://addteq.com/category/webinars/>

If you have specific need and would like custom demo or solution reach out to us @ sales@addteq.com