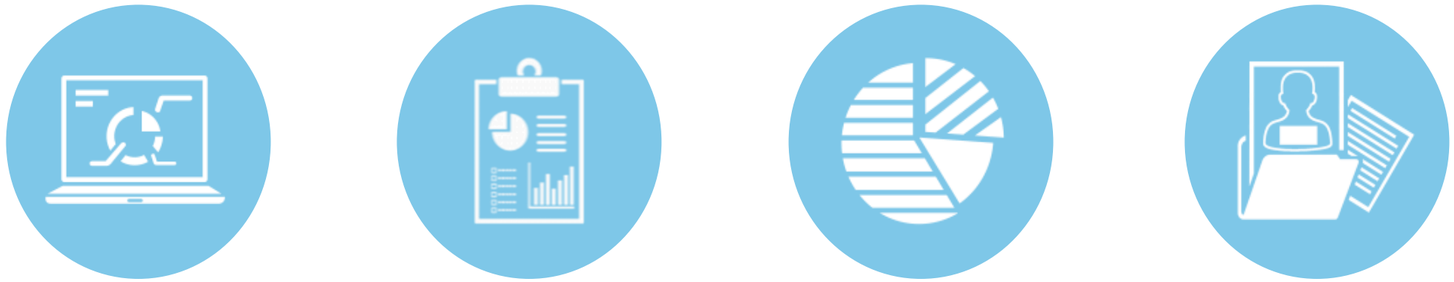
DevOps Certification Training

Lesson 01: Introduction to DevOps



Learning Objectives

By the end of this lesson, you will be able to:

- State the principles of DevOps
- Explain the challenges in the traditional approach
- Describe how DevOps helps in overcoming challenges faced in traditional approach
- Describe the DevOps tools
- Explain DevSecOps and it's importance

Introduction to DevOps

DevOps Overview and Principles

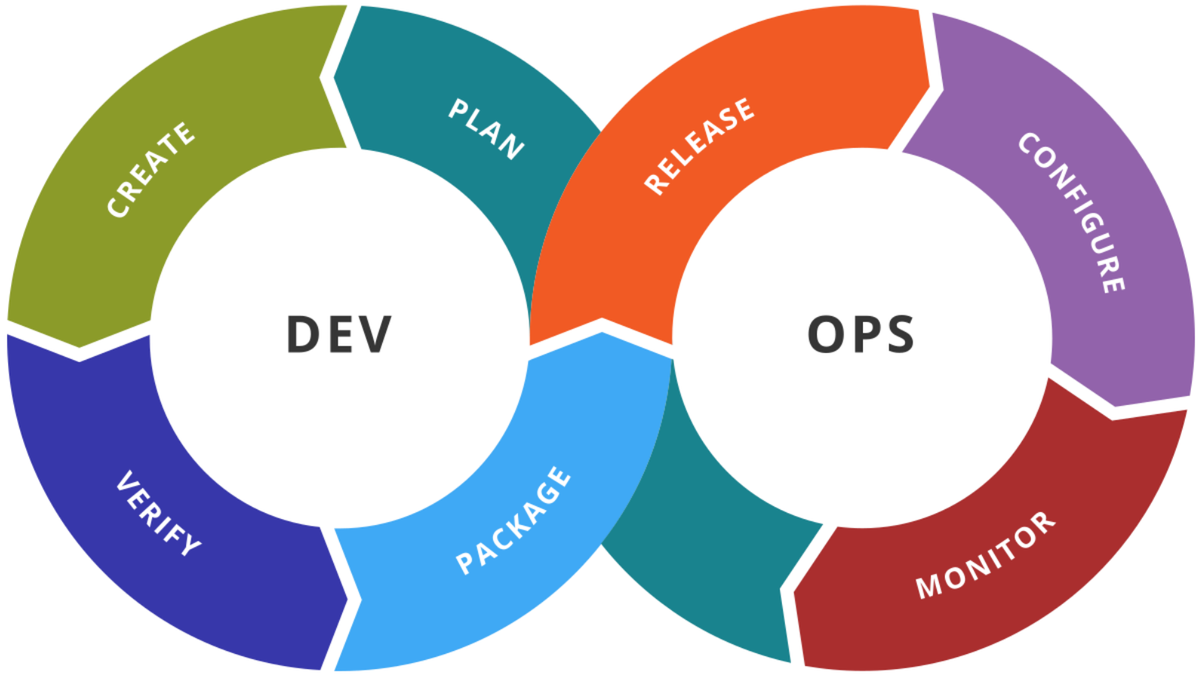
DevOps

DevOps is short for **Dev**elopment and **Op**eration**s**. It concentrates on collaboration between developers and other parties involved in building, deploying, operating, and maintaining software systems.

History of DevOps

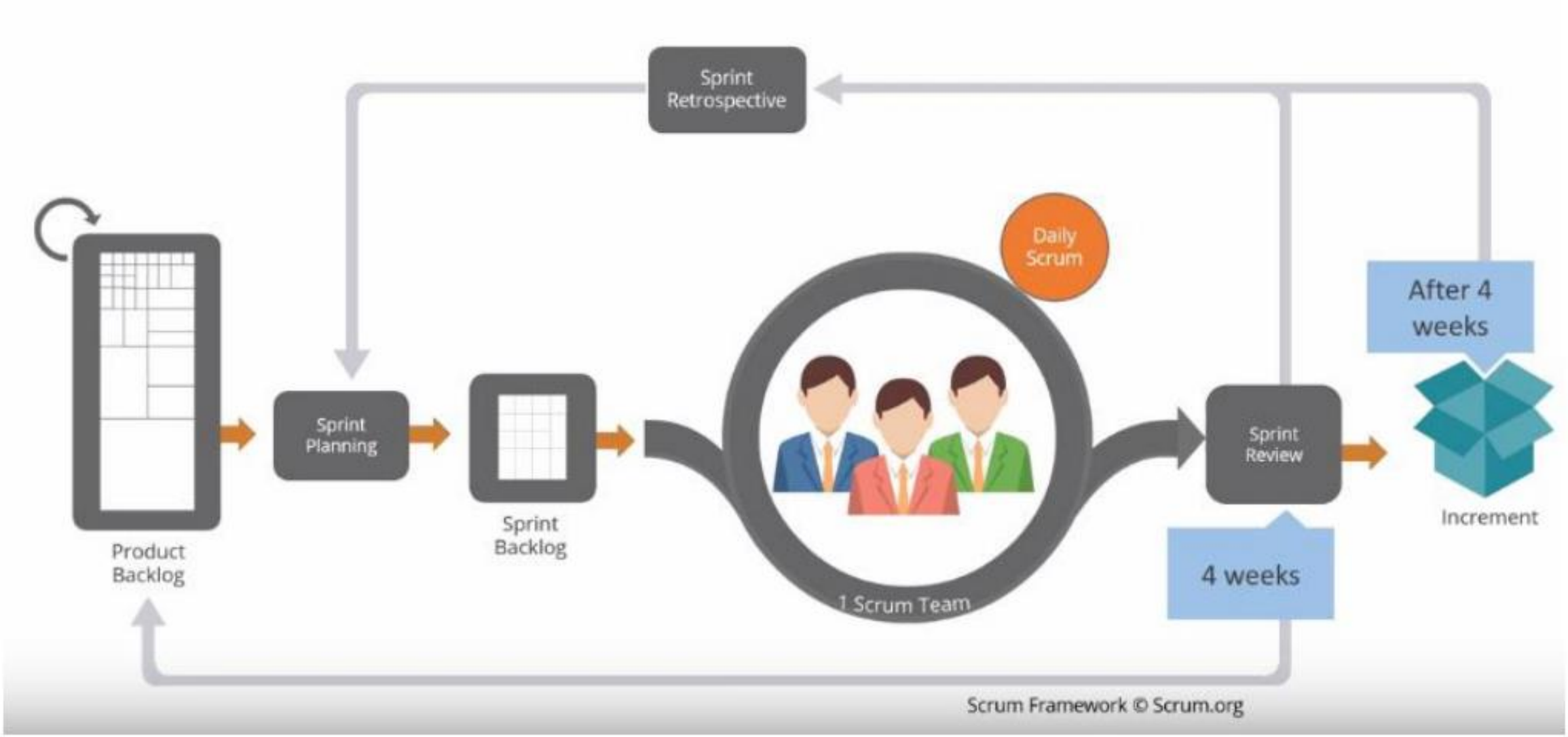
- Patrick Debois, a Belgian consultant, project manager, and agile practitioner is one among the initiators of DevOps.
- A presentation on “10+ Deploys per Day: Dev and Ops Cooperation at Flickr” helped in bring out the ideas for DevOps and resolve the conflict of “ It’s not my code, it’s your machines! ”
- DevOps blends lean thinking with agile philosophy.

Overview of DevOps



- DevOps is an agile relationship between development and IT operations
- DevOps is the abbreviation for **Dev**elopment and **Op**erations
- The Development includes Plan, Create, Verify, and Package
- The Operations include Release, Configure, and Monitor

Agile Example: Scrum



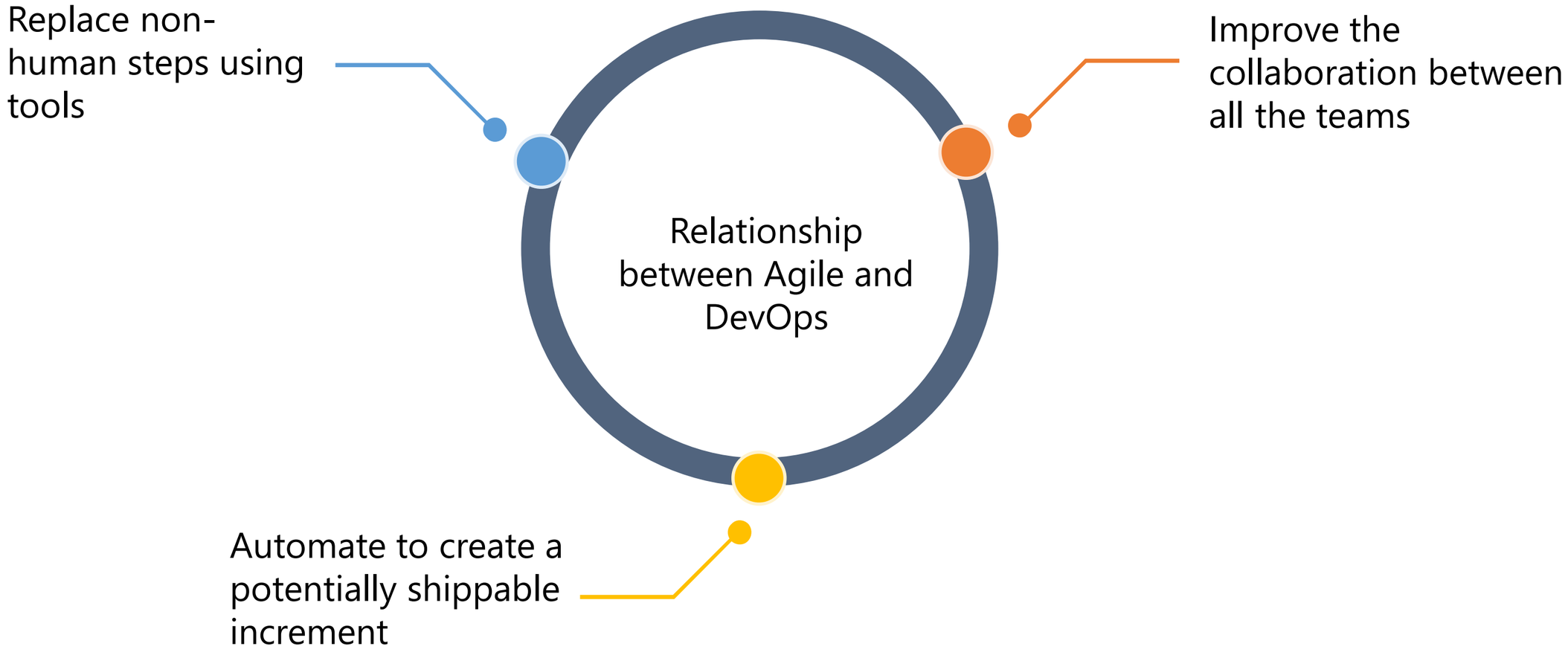
Relationship Between Agile and DevOps

Satisfy the customer through early and continuous delivery of valuable software

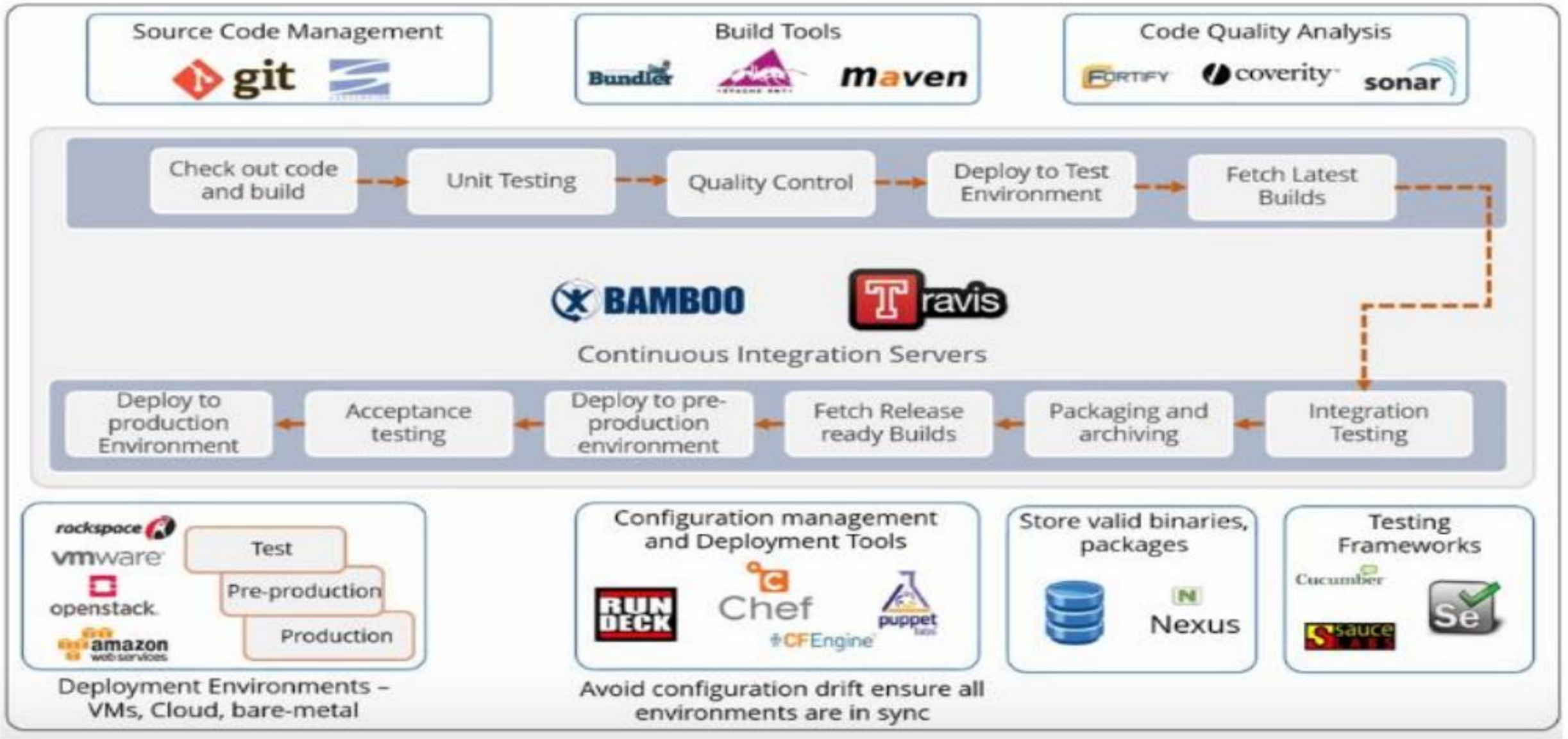
Deliver working software frequently with a preference for the shorter timescale

Business people and developers must work together daily throughout the project

Relationship Between Agile and DevOps



Agile and DevOps Example



DevOps Toolchains

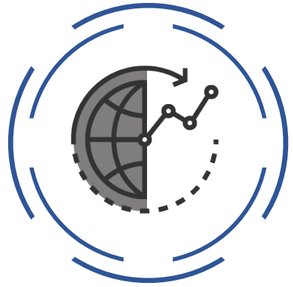
Monitoring Performance

Releasing into Production

Building Applications

Code Development and Unit Testing

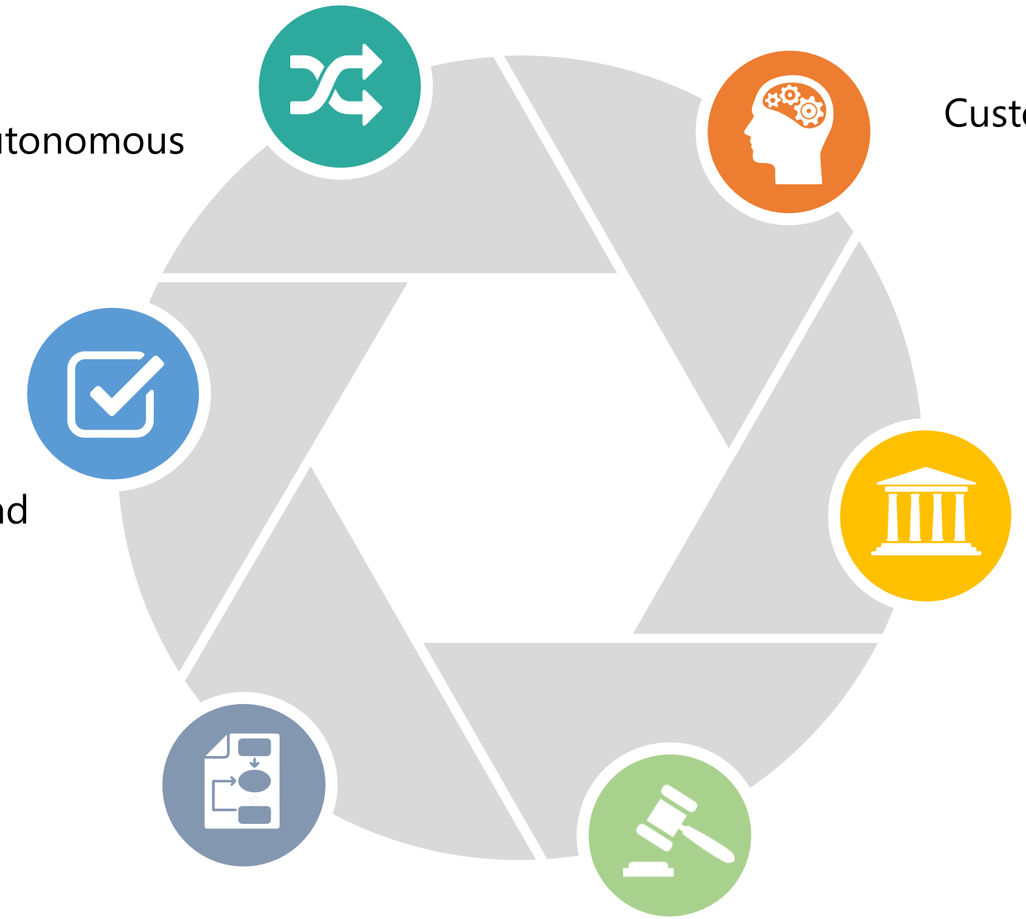
Configuration Management



Integration and Performance Testing

Packing the Application

DASA DevOps Principles



Cross-functional autonomous teams

Customer-centric action

Create with the end in mind

End-to-end responsibility

Continuous improvement

Automate everything you can

Case Study

Amazon switched to DevOps at the development phase of their web services, popularly known as AWS.

Introduction to DevOps

Challenges in the Traditional Approach

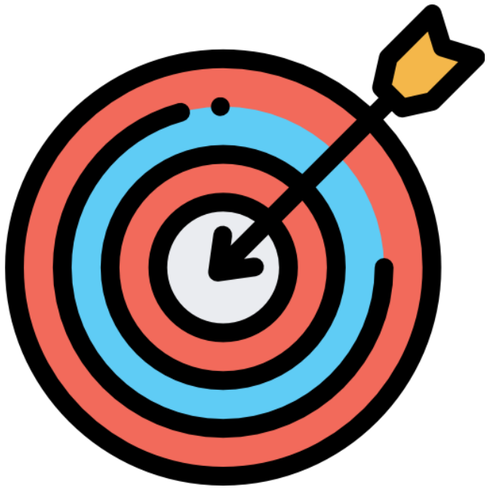
Waterfall Method

Most of the development teams use waterfall method, which is time-consuming because of the larger size of the developer team, testers, and the code involved.

Productivity

Codes that are large and bundled into release will result in jammed production and lower the productivity.

Difficult to Achieve Goal

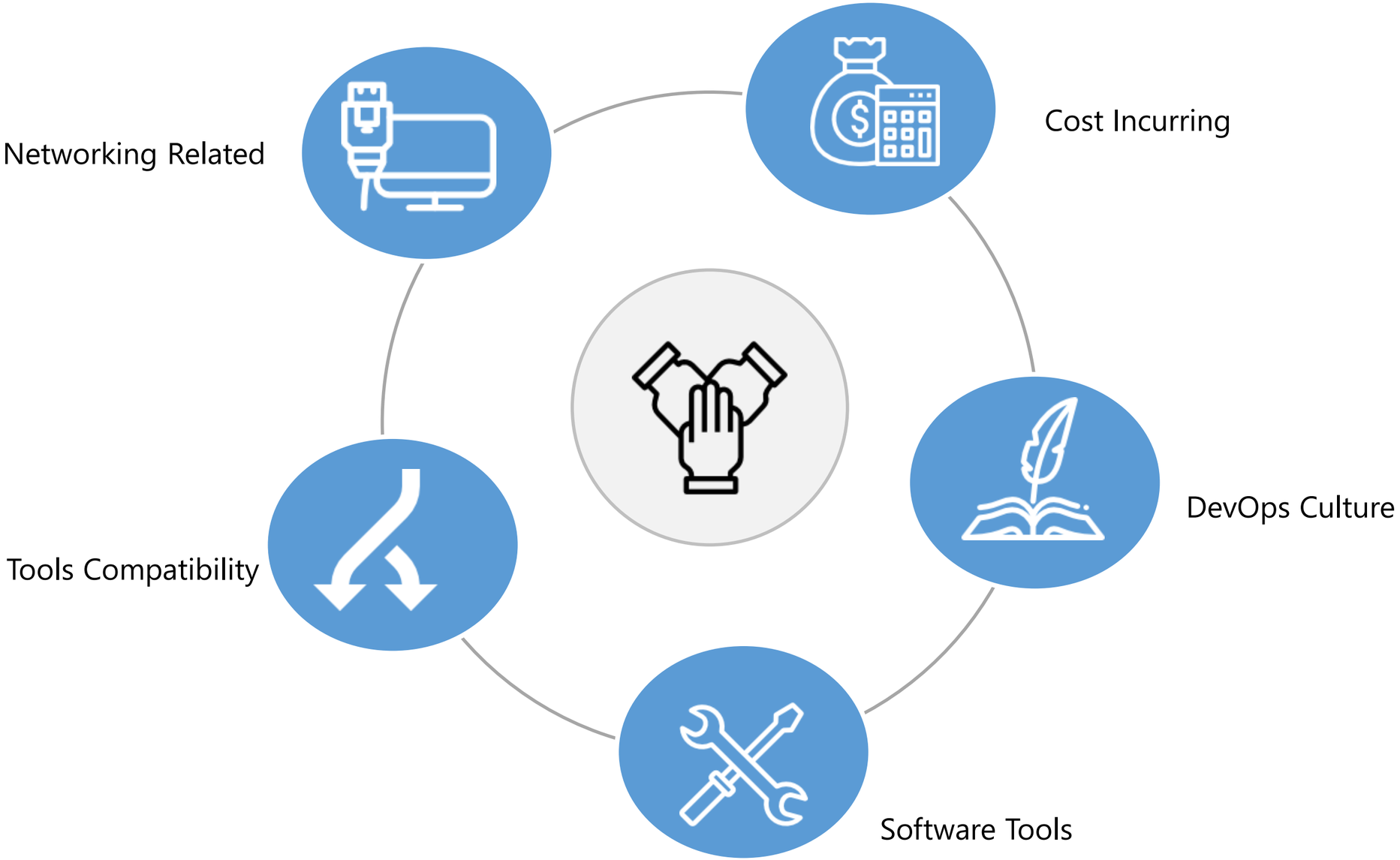


Less investment on resources and constant work make it difficult for the developers to achieve goal or an outcome.

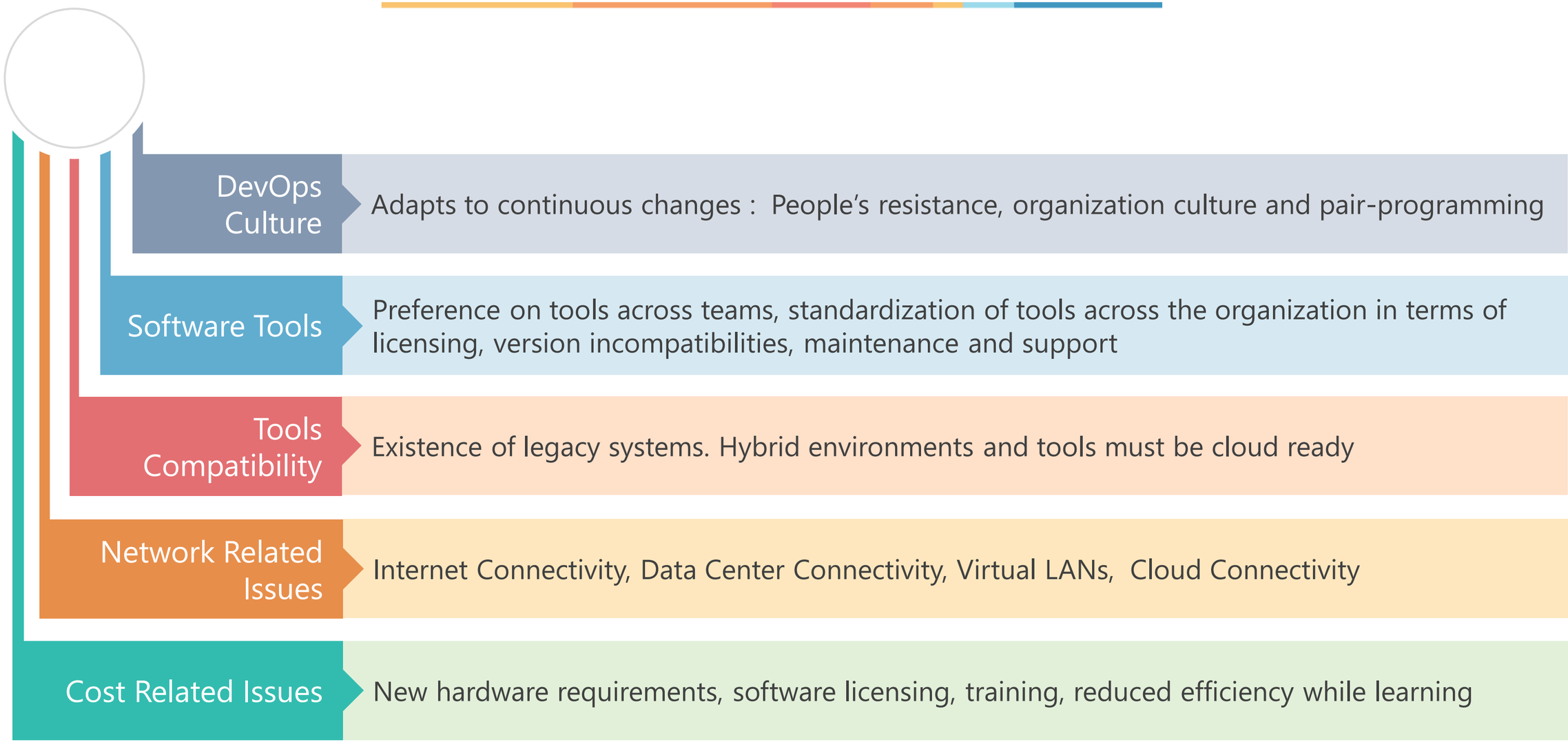
Investment in Schedule Planning Systems

More money is invested in schedule planning systems which are sensitive and inaccurate. As a result, it consumes more time to manage the systems.

Constantly Changing Challenges



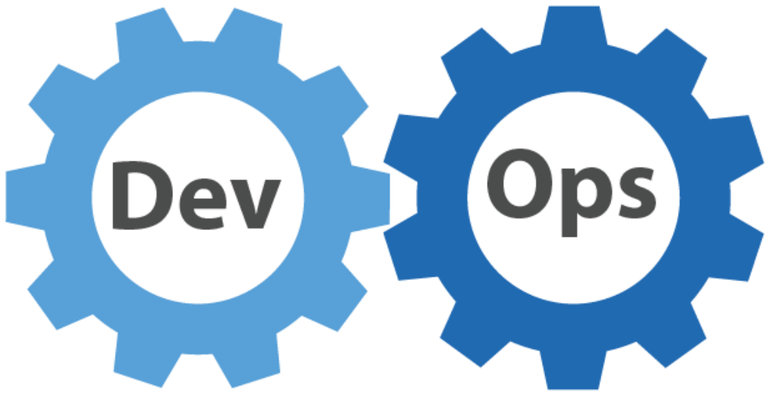
Types of Constantly Changing Challenges



Introduction to DevOps

DevOps Approach to the Challenges

DevOps Way to Overcome Challenges



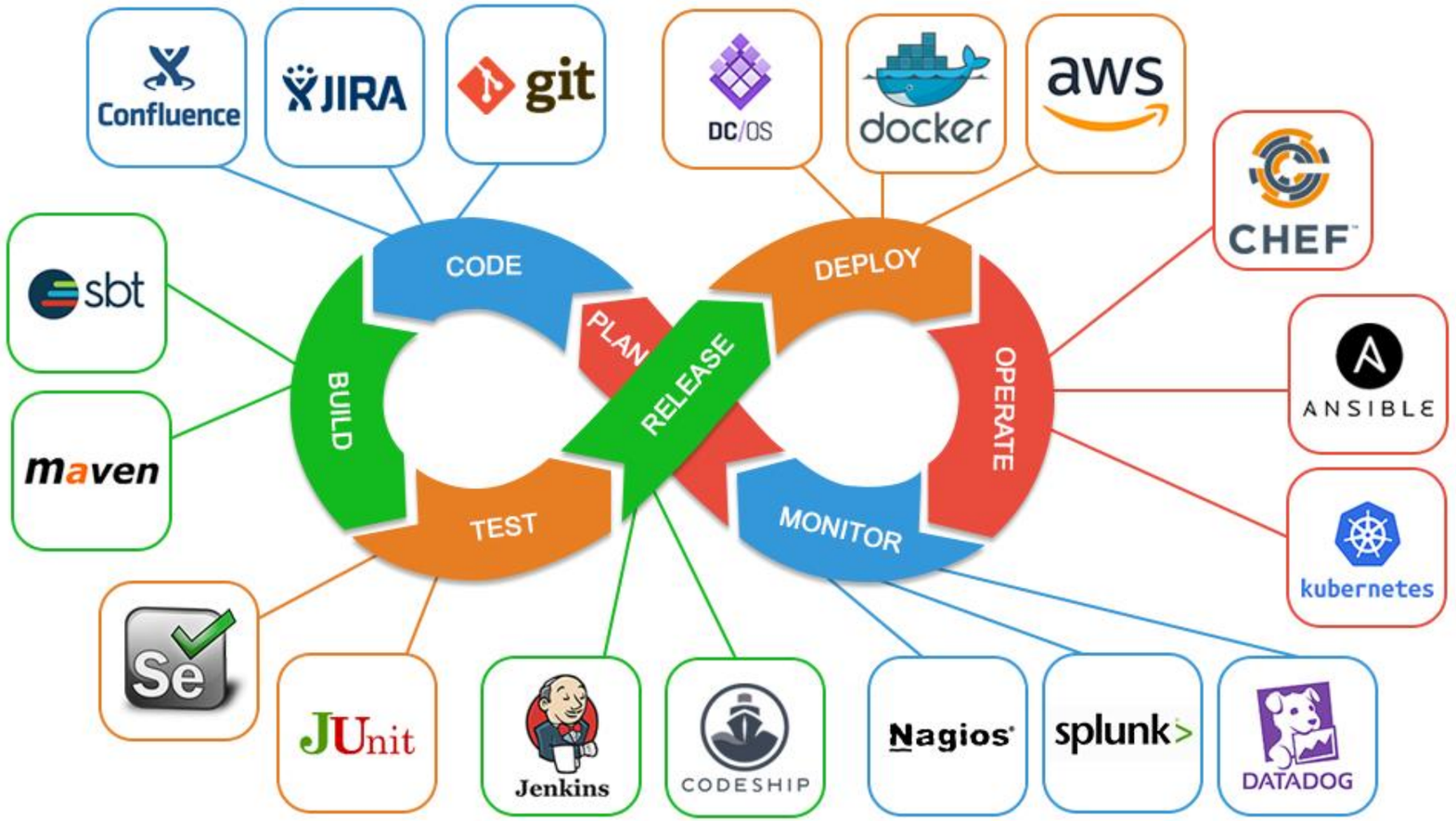
- Reduction in the code size delivery results in increased productivity
- Smaller batch sizes, dedicated teams, and automated processes make scheduling simpler to operate
- Batch sizes are divided into small cells. Each cell gathers its own data, reducing the size of the reports
- Identifies productive and loss areas in the process. As a result, an organization can focus more on their goals

Introduction to DevOps

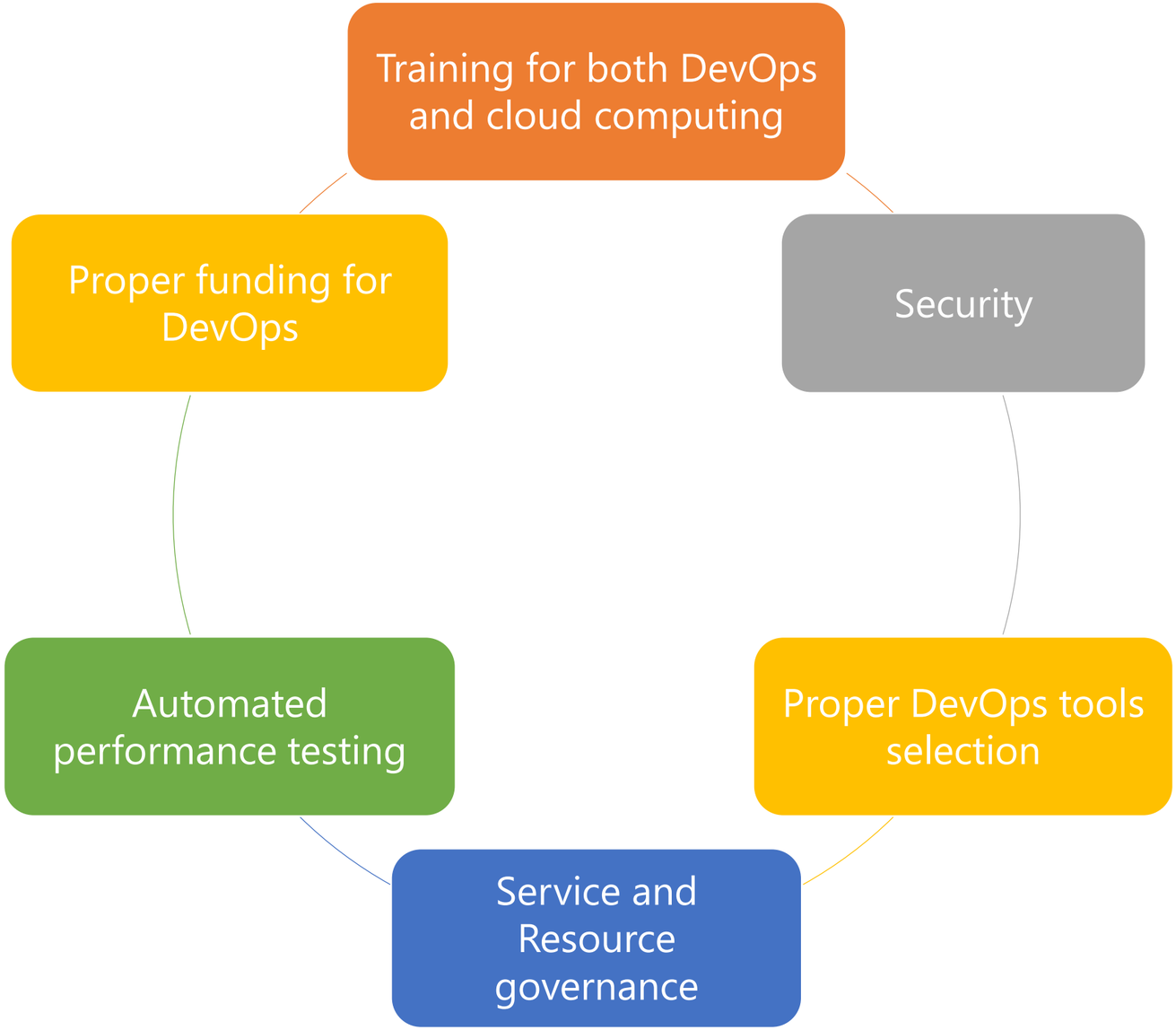
Overview of DevOps Tools

DevOps Tools

To implement DevOps and work within the DevOps setup, the various tools required are:



Best Practices for DevOps



DevOps and Cloud Computing Training

Proper training in DevOps and cloud computing will lead to better understanding and help resolve challenges in DevOps environment.

Security

Security should be part of the automated testing. It should be built into continuous integration and deployment processes during the migration to cloud-based platform.

Proper DevOps Tools Selection

The Applications should be deployable on different clouds. In this way, you can pick and choose the best public or private cloud for the job.

Open source and licensed tools

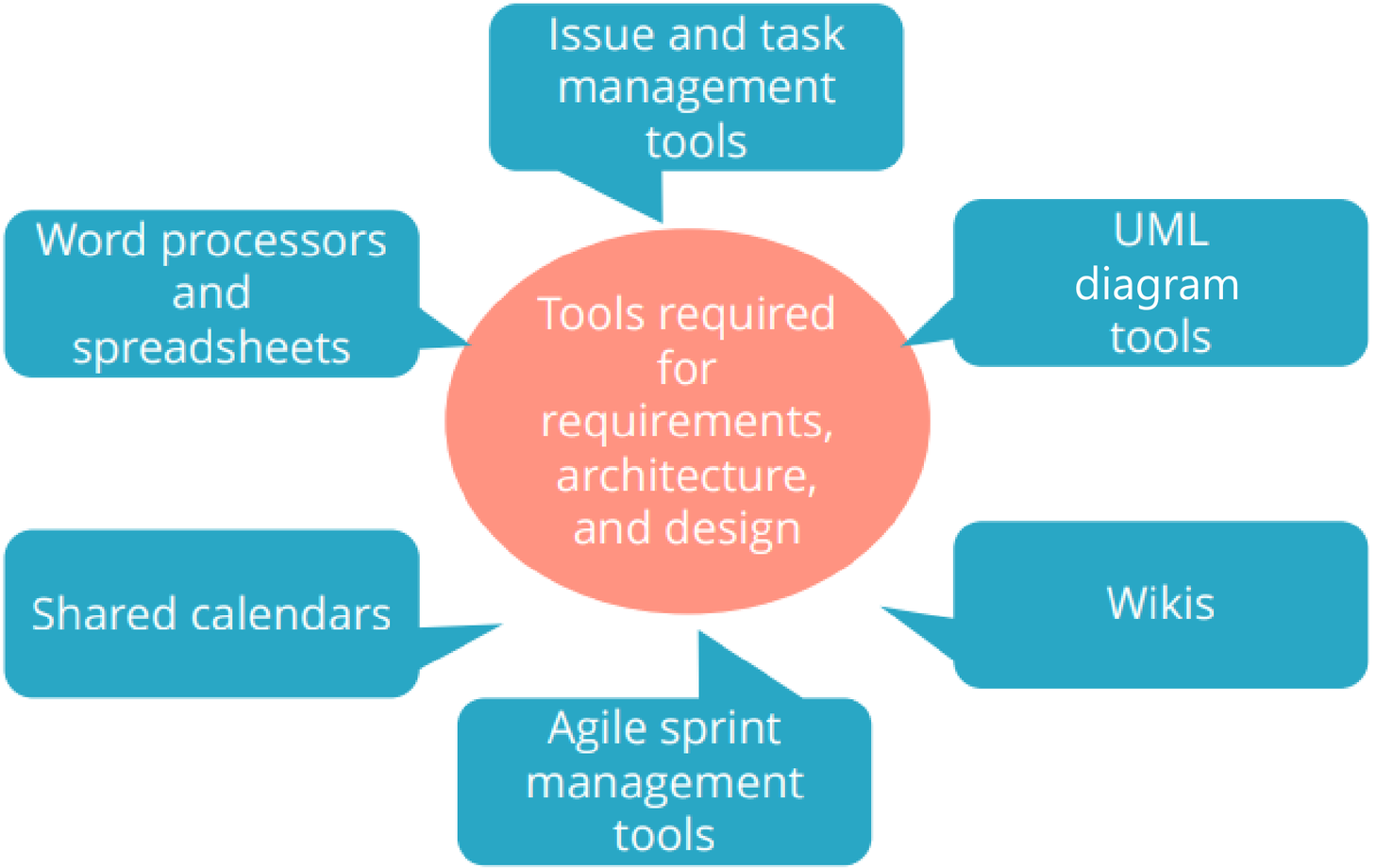
Tools that work together

Tools for different SDLC phases

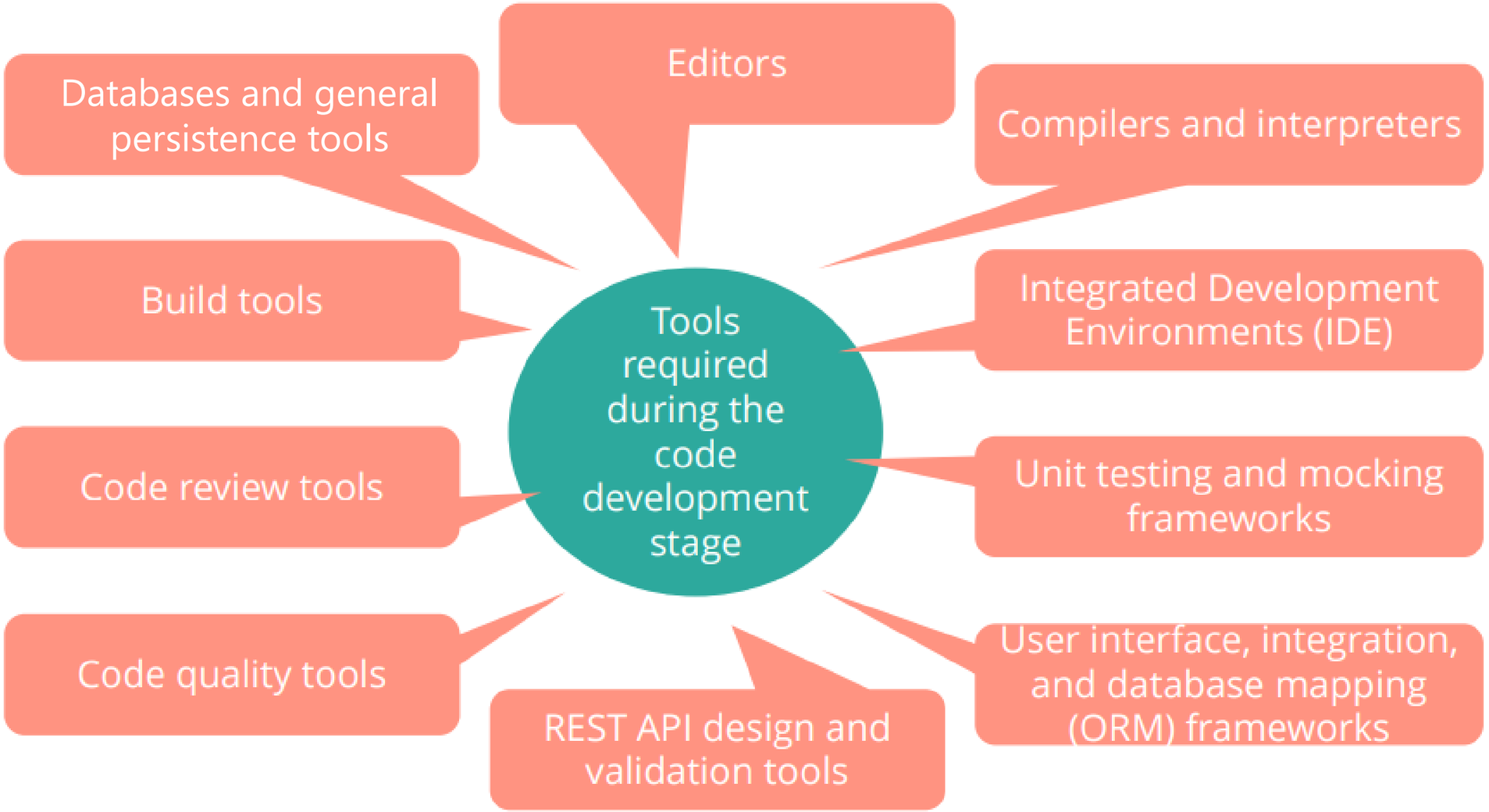
Tools that perform similar functions

Requirements Tools

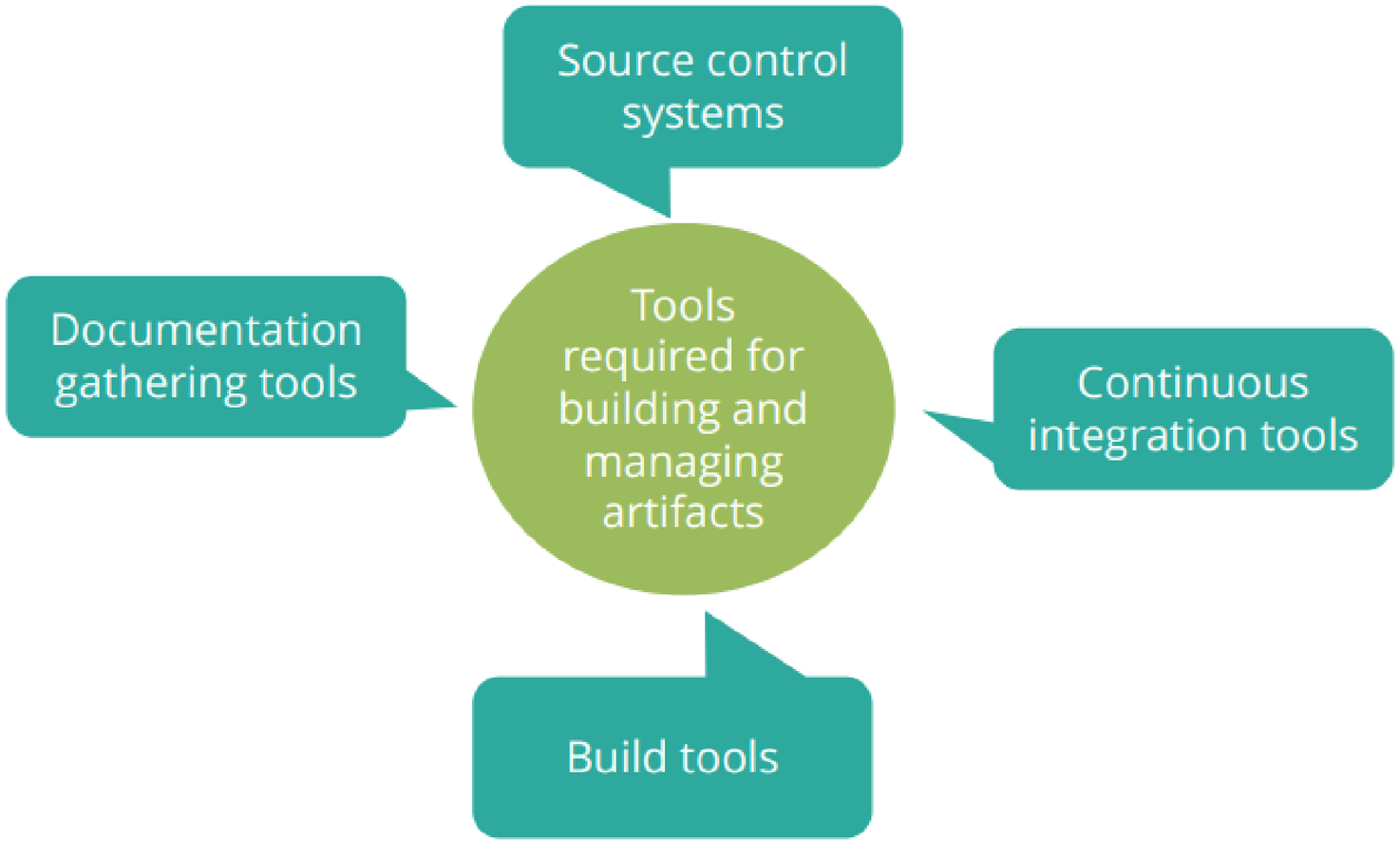
Tools are used to share the files and communicate within the team and other teams.



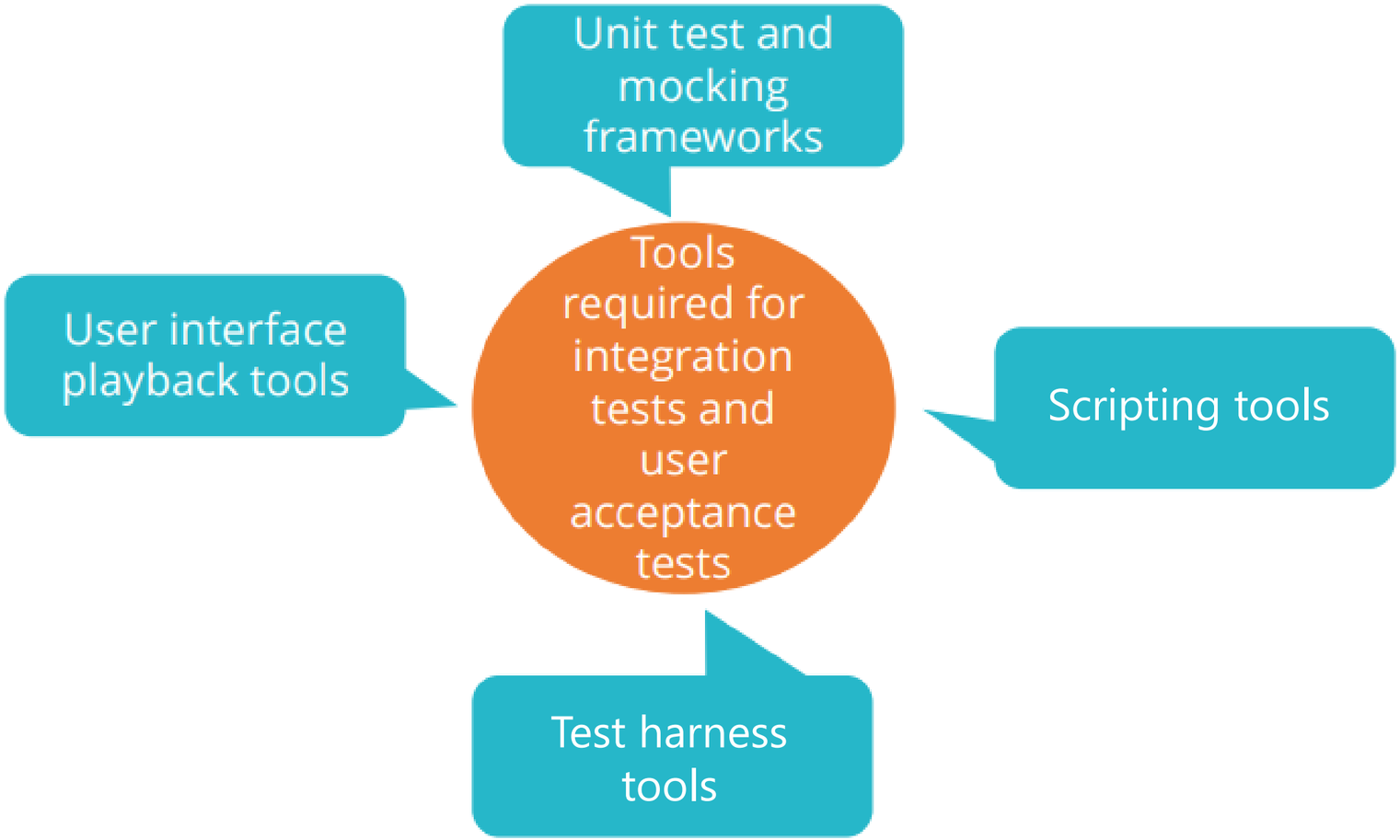
Code Development Tools



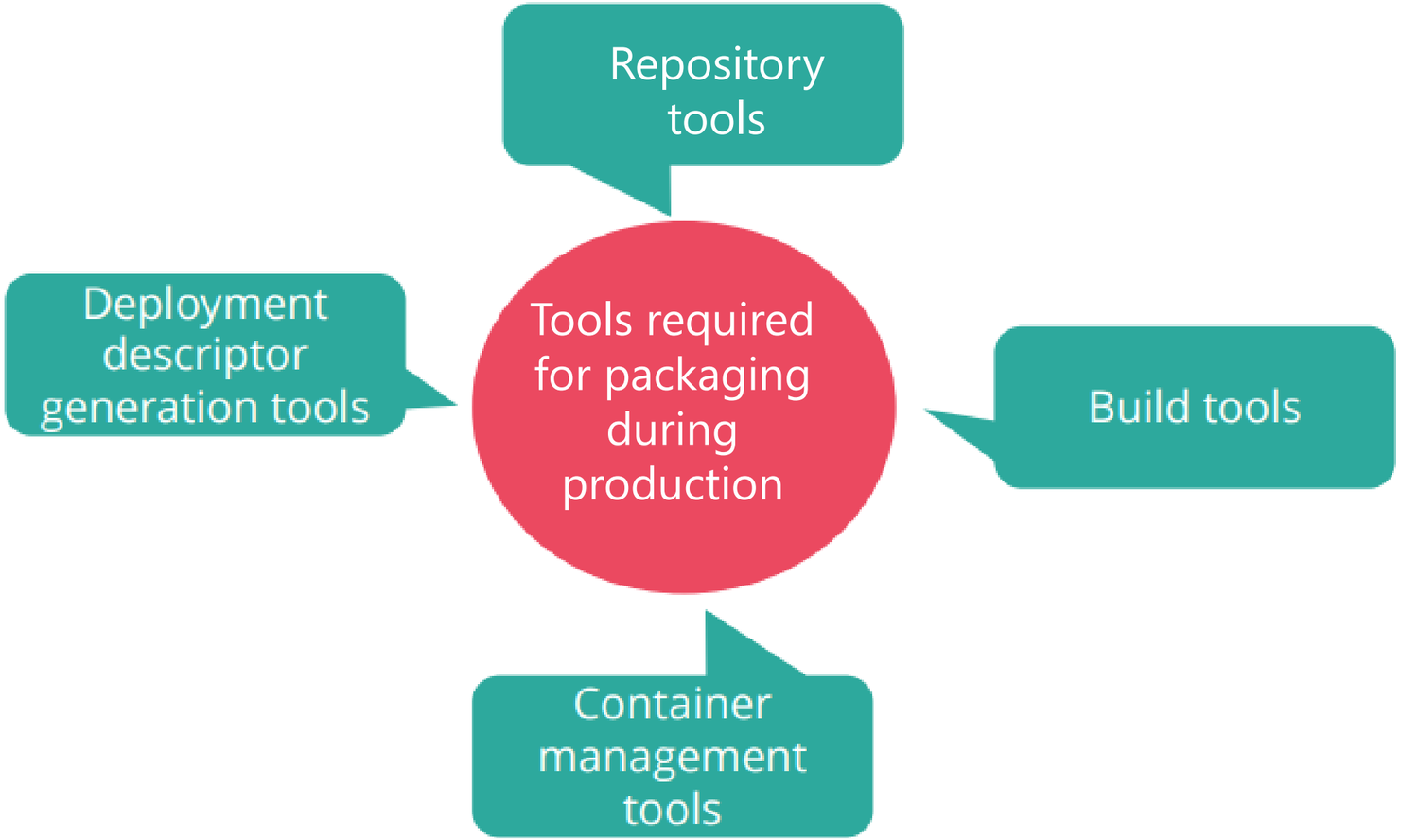
Artifact Creation Tools



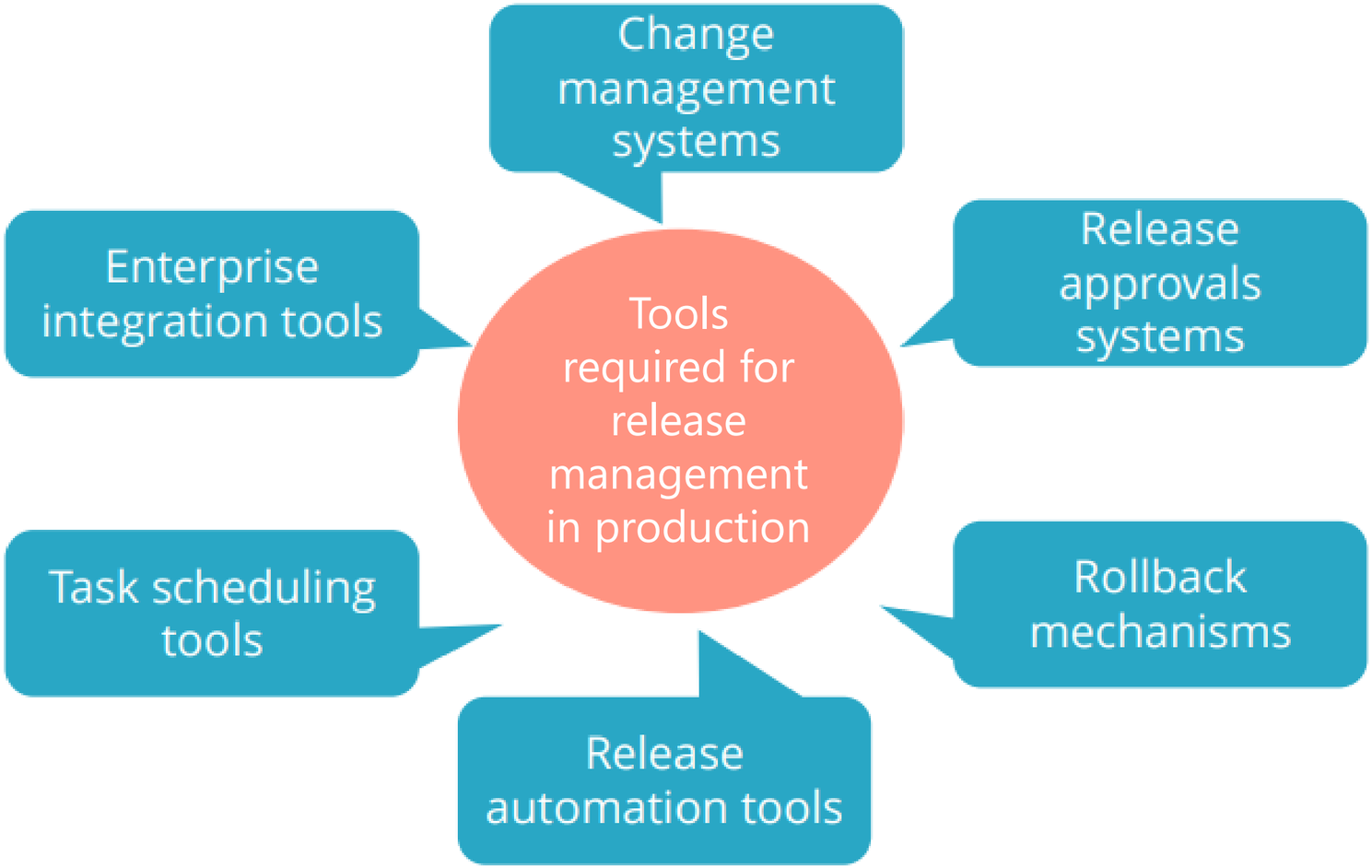
Testing Tools



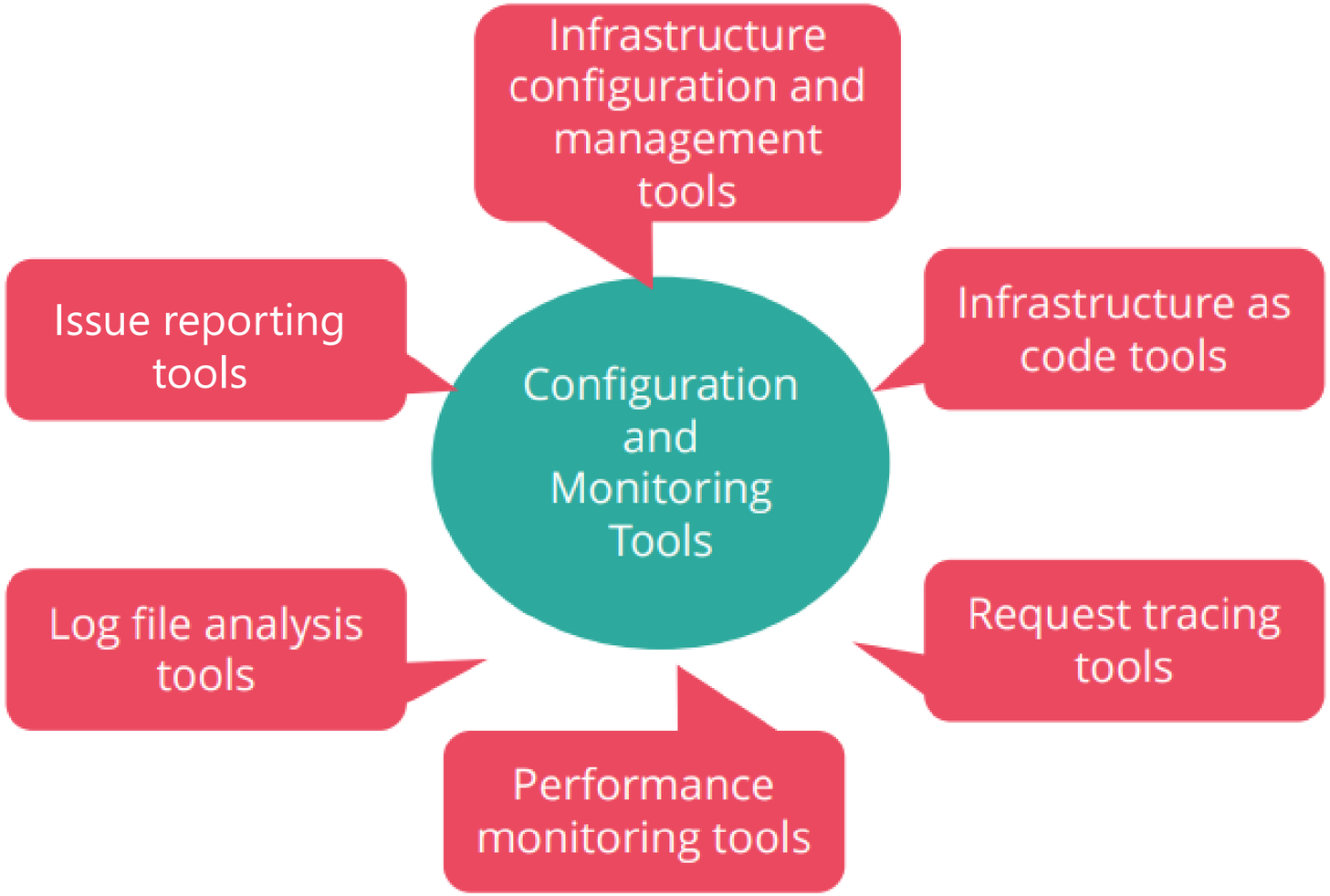
Packaging Tools



Release Management Tools



Configuration and Monitoring Tools



Introduction to DevOps

DevSecOps and It's importance

DevSecOps

DevSecOps is the ideology of integrating security practices within the DevOps culture.

01 Creates a ‘Security as Code’ Culture

02 Creates a flexible collaboration between the team members

03 Bridges traditional gaps between IT and Security

04 Aims to embed security in every part of the development process

DevSecOps Manifesto

Leaning in over Always Saying “no”

Data & Security Science over Fear, Uncertainty and Doubt

Open Contribution & Collaboration over Security-Only Requirements

Consumable Security Services with APIs over Mandated Security Controls & Paperwork

Business Driven Security Scores over Rubber Stamp Security

Red & Blue Team Exploit Testing over Relying on Scans & Theoretical Vulnerabilities

24*7 Proactive Security Monitoring over Reacting after being informed of an incident

Shared Threat Intelligence over Keeping Info to Ourselves

Compliance Operations over Clipboards & Checklists

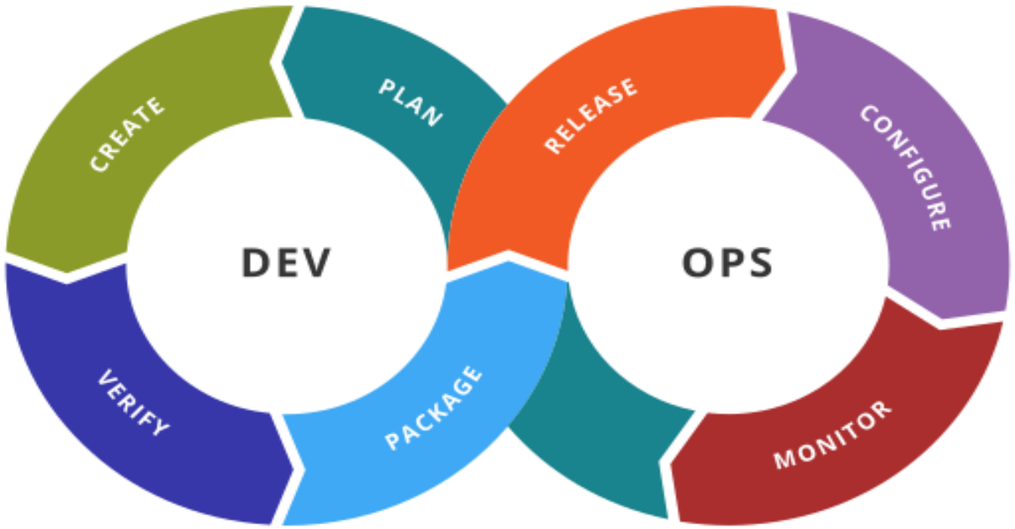
Workflow of DevOps and DevSecOps

- A Developer writes a code for a feature within the version control management system
- The required changes are committed to the version control management system
- Another Developer retrieves the code from the version control management system and performs analysis of the code to identify security threats
- An environment is created using any management tool such as puppet or chef. The application is deployed and security configurations are applied to the system.

Workflow of DevOps and DevSecOps (Contd.)

- A test automation suite is executed against the deployed application on factors like UI, integration, security tests, and APIs
- If the application passes the test, it is deployed to the production environment
- The newly production environment is monitored continuously to identify any active security threats

DevOps vs. DevSecOps



Features:

Speed

Rapid delivery

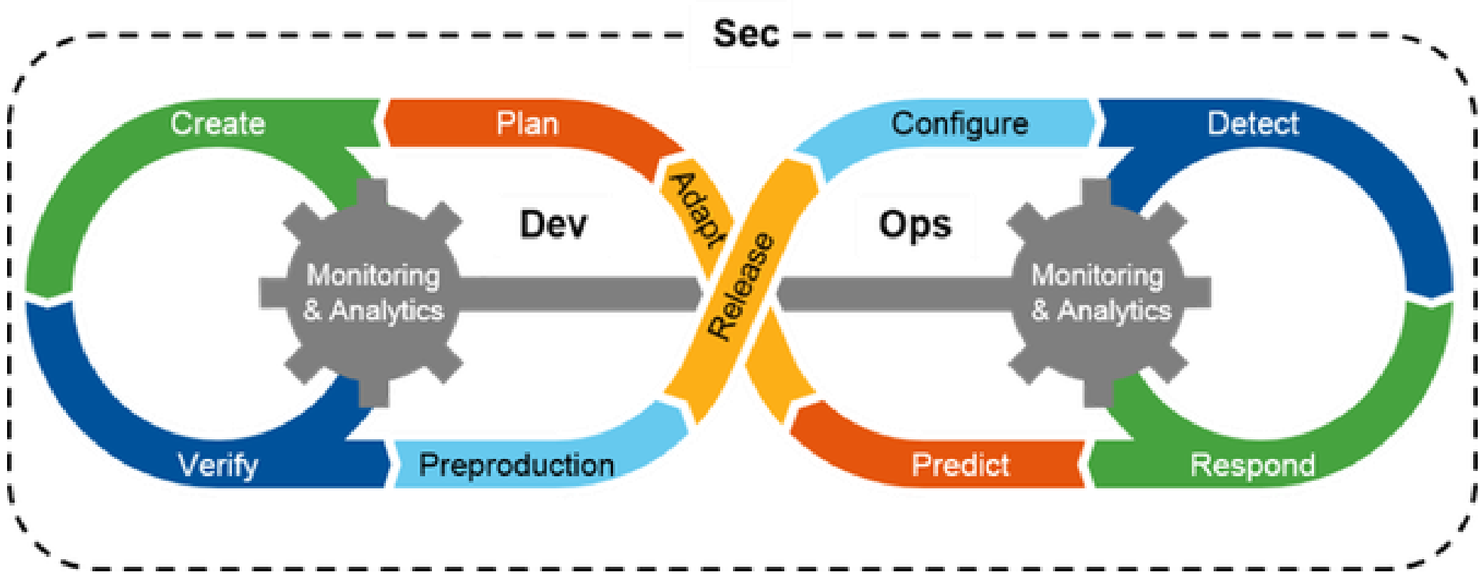
Scaled and less secured

Features:

Agility

Security automation

Security as code



Key Takeaways

You are now able to:

- State the principles of DevOps
- Explain the challenges in the traditional approach
- Describe how DevOps helps in overcoming challenges faced in traditional approach
- Describe the DevOps tools
- Explain DevSecOps and it’s importance

Knowledge Check

Knowledge Check

1

Which one of the following methodologies has least impact on DevOps methodology?

a. Lean Manufacturing

b. Agile Software Delivery

c. Waterfall Software Delivery

d. Continuous Software Delivery

Knowledge Check

1

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a. Lean Manufacturing

b. Agile Software Delivery

c. Waterfall Software Delivery

d. Continuous Software Delivery

The correct answer is **c. Waterfall Software Delivery**

Knowledge Check

2

Which one of the following techniques makes DevOps a successful methodology to develop and deliver software?

a. DevOps helps in organizing the teams and organizational mission

b. DevOps helps in creating the software with built-in quality and monitoring

c. DevOps helps to quickly identify, fix and learn from errors

d. All of the above

Knowledge Check

2

Which one of the following techniques makes DevOps a successful methodology to develop and deliver software?

a. DevOps helps in organizing the teams and organizational mission

b. DevOps helps in creating the software with built-in quality and monitoring

c. DevOps helps to quickly identify, fix and learn from errors

d. All of the above

The correct answer is **d. All of the above**

Knowledge Check

3

Which is the best technique to convert normal changes into standard changes?

a. Use the existing track record of successful automated deployments with standard changes

b. Negotiate with release managers

c. Publicly complain about bureaucracy and make everyone be aware of it

d. Make sure normal changes are very carefully deployed to the production

Knowledge Check

3

Which is the best technique to convert normal changes into standard changes?

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b. Negotiate with release managers

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d. Make sure normal changes are very carefully deployed to the production

The correct answer is **a. Use the existing track record of successful automated deployments with standard changes**

Knowledge Check

4

Which is the widely reusable asset to reinforce information security?

a. Data Storage Systems

b. Tools handling the logging of sensitive client information

c. Transfer of data between clients and software

d. All of the above

Knowledge Check

4

Which is the widely reusable asset to reinforce information security?

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d. All of the above

The correct answer is **d. All of the above**

Knowledge Check

5

What is the benefit of using feature toggles embedded in configuration of the application during fixing errors?

a. Easiest way to fix a problem

b. Don’t have to correct erroneous pieces immediately during deployment

c. DevOps team can take time to properly identify root cause of an issue and improve the techniques

d. All of the above

Knowledge Check

5

What is the benefit of using feature toggles embedded in configuration of the application during fixing errors?

a. Easiest way to fix a problem

b. Don’t have to correct erroneous pieces immediately during deployment

c. DevOps team can take time to properly identify root cause of an issue and improve the techniques

d. All of the above

The correct answer is **d. All of the above**

Thank You