

# SAP Continuous Testing: Essentieel!

Stefan Gerstner

Jeanine Hoogerbrug



VERBINDT. VERSTERKT.

# Speakers



## **Stefan Gerstner**

VP Quality Engineering & Testing

[stefan.gerstner@sogeti.com](mailto:stefan.gerstner@sogeti.com)

<https://www.linkedin.com/in/stefan-gerstner-225b6a1/>



## **Jeanine Hoogerbrug**

SAP Test Expert

[jeanine.hoogerbrug@sogeti.com](mailto:jeanine.hoogerbrug@sogeti.com)

<https://www.linkedin.com/in/jeaninehoogerbrug/>

Key findings of the report 'State of Worldwide Business Assurance for SAP solutions - 2023', learnings from recent client engagements and recommendations for team enablement.



State of

# Worldwide Business Assurance

for SAP solutions – 2023



Download a copy:

[www.sogeti.com/explore/reports/  
state-of-worldwide-business-assurance-for-sap-solutions-2023/](http://www.sogeti.com/explore/reports/state-of-worldwide-business-assurance-for-sap-solutions-2023/)





# Report sections

1. Current SAP landscape
2. Outsourcing Trends for SAP Business Assurance
3. SAP Business Assurance – Approach, Maturity, and Automation
4. Challenges in SAP Testing
5. Ideal Business Assurance Capabilities



# Report sections

- 1. Current SAP landscape**
2. Outsourcing Trends for SAP Business Assurance
- 3. SAP Business Assurance – Approach, Maturity, and Automation**
- 4. Challenges in SAP Testing**
5. Ideal Business Assurance Capabilities





**Section 1**

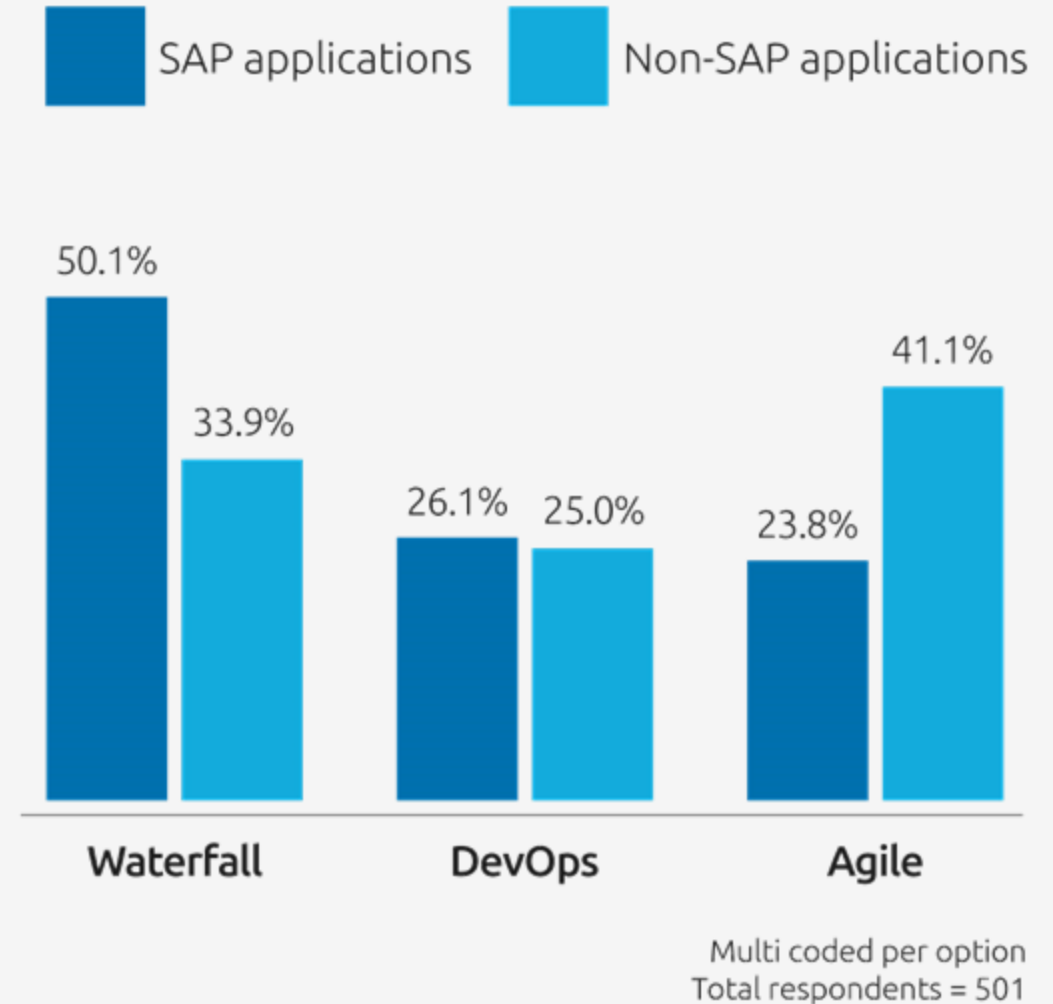
**Current  
SAP landscape**

# Waterfall approach still popular

- Waterfall remains the most popular implementation and development methodology for SAP at 50.1%, followed by DevOps

“Implementing a centralized or global ERP system can provide standardization, resulting in fewer interfaces and quicker implementation of standard changes. However, introducing a two-tier ERP system allows businesses the needed flexibility, alongside standardization. For example, if a company acquires a small business that differs significantly from its core business, integrating it into the central ERP system can be complicated. Larger organizations may benefit from using a two-tier ERP approach as it allows them to limit downtime requirements by providing more flexibility to perform maintenance at departmental or functional levels. Plus, the decentralized model is effective in managing maintenance needs as organizations cannot afford downtime.”

— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company



Which implementation methodology is the most frequently deployed for SAP and non-SAP applications within your organization?

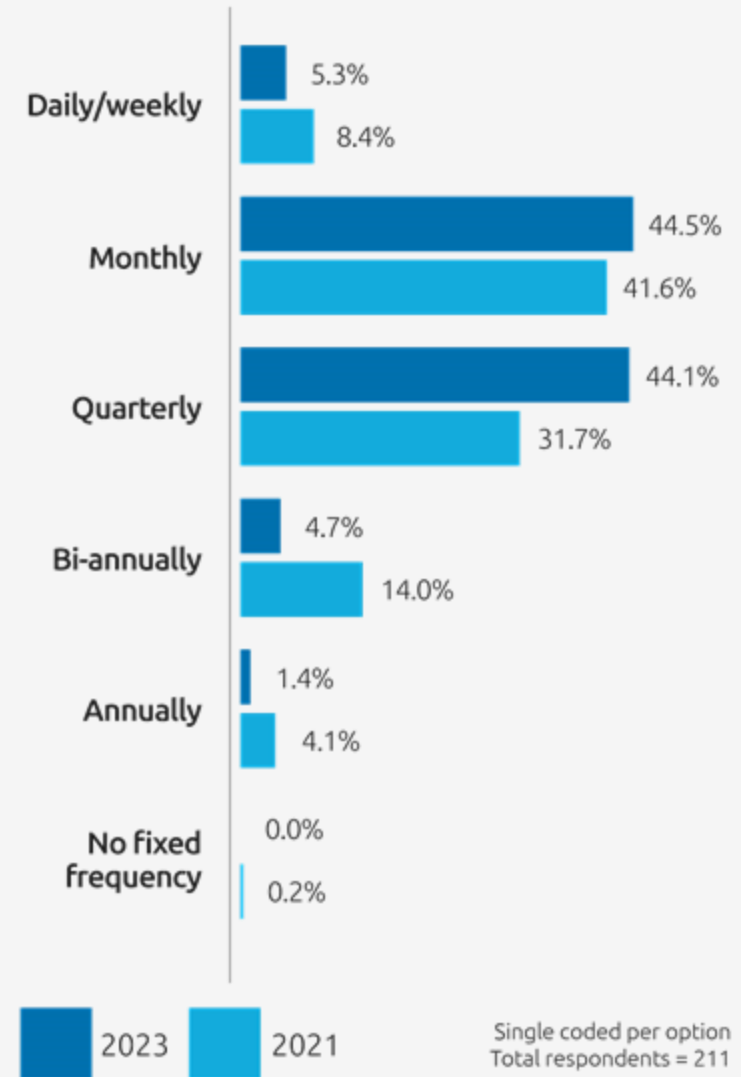


# Increasing frequency of SAP upgrades

- Monthly and quarterly upgrades most prominent
- 4.5% of organizations incorporate upgrades to their on-premise SAP applications on a monthly basis, and 44.1% every quarter

“Regular upgrades play a critical role in ensuring the security and stability of an organization’s systems. By keeping the system up-to-date, organizations can minimize the risk of security breaches, downtime, and productivity loss. Additionally, updating the system regularly can help organizations reduce the costs and risks associated with vulnerabilities that can arise over time.”

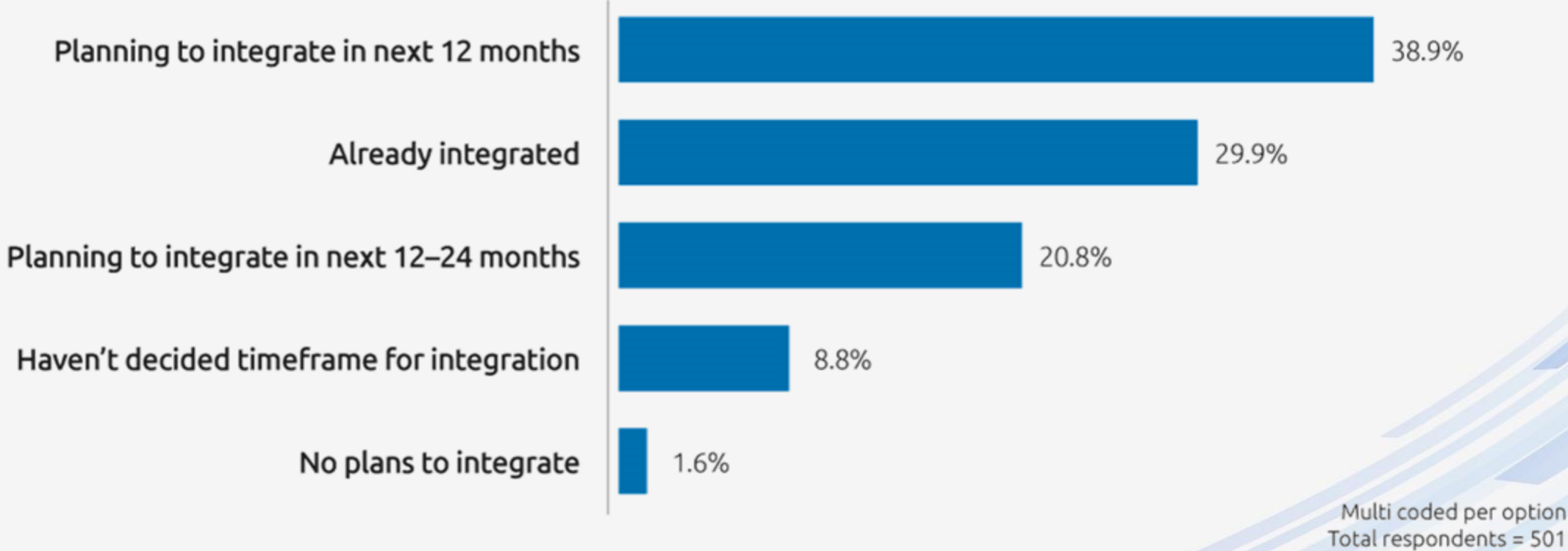
— Global Director – Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company



What is the frequency of SAP upgrades for on-premise SAP applications in your organization?



# Integration in CI/CD pipeline a key requirement



To what extent has your organization integrated SAP applications into automated Continuous Integration/Continuous Delivery (CI/CD) pipeline?

# Continuous Integration – Delivery - Testing

## Continuous Integration

Door zo *vroeg* en *vaak* mogelijk code te integreren in de main branch van een gedeelde repository minimaliseert continuous integration de integratiekosten in een ontwikkelproces en wordt *frequent* en *geautomatiseerd testen* mogelijk gemaakt. Door het starten van geautomatiseerde tests zodra een ontwikkelaar een nieuwe code samenvoegt, kunnen test suites worden uitgevoerd om te controleren of er nieuwe integratiefouten zijn geïntroduceerd.

## Continuous Delivery

De code (applicatie) bevindt zich altijd *in een staat waarin 'deployment' mogelijk is*. Deze aanpak leunt zwaar op de automatisering van de test- en delivery processen, om ervoor te zorgen dat deze zonder enige hapering plaatsvinden.

## Continuous Testing

*Geautomatiseerde testuitvoering* die telkens wordt uitgevoerd als software is geïntegreerd in een build en voordat een nieuwe build wordt geïmplementeerd. Het testen i.c.m. Continuous Delivery gebeurt in fasen, waarbij de volgende fase automatisch aangevangen wordt als de voorgaande fase succesvol is afgerond. Dit vindt plaats totdat de applicatie echt klaar is voor 'deployment'.



# A Generic CI/CD pipeline

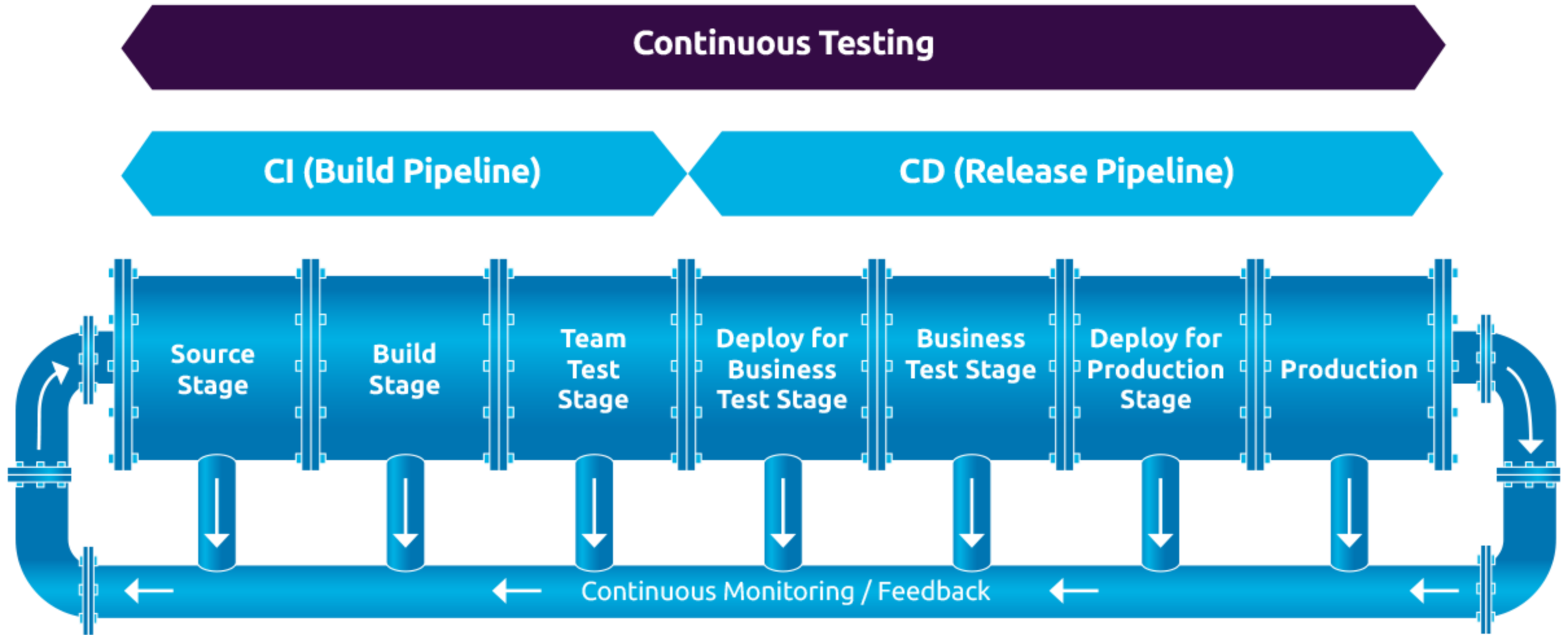


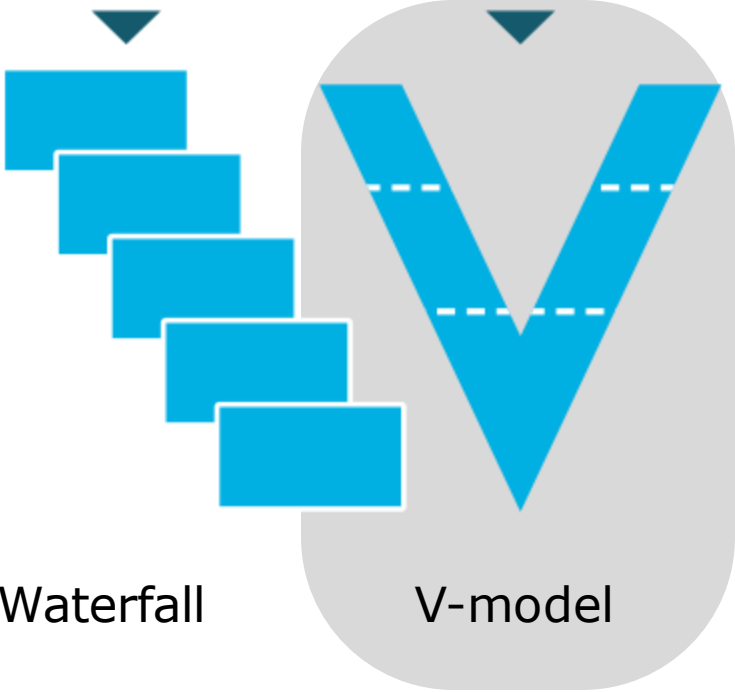
Figure 6.1 from the "Quality for DevOps"-book

# IT delivery models

Sequential  
IT delivery

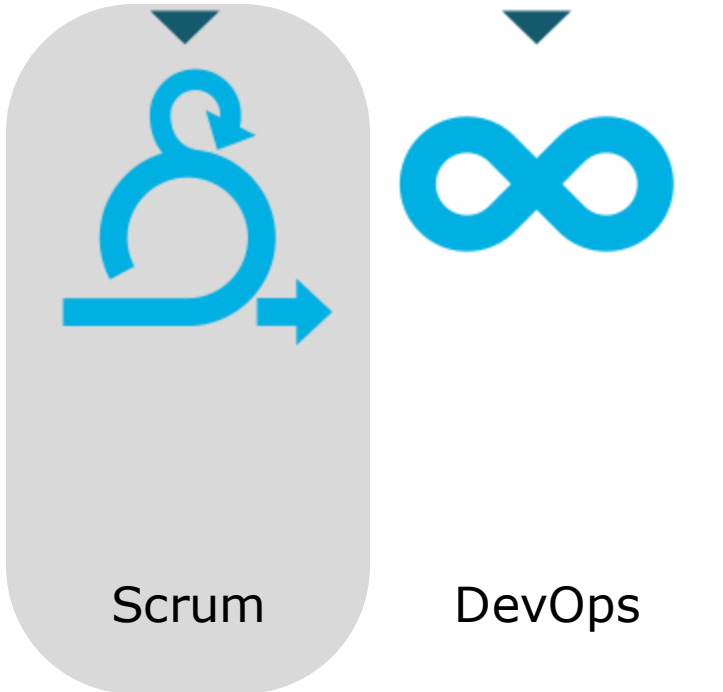
High-Performance  
IT delivery

Hybrid  
IT delivery



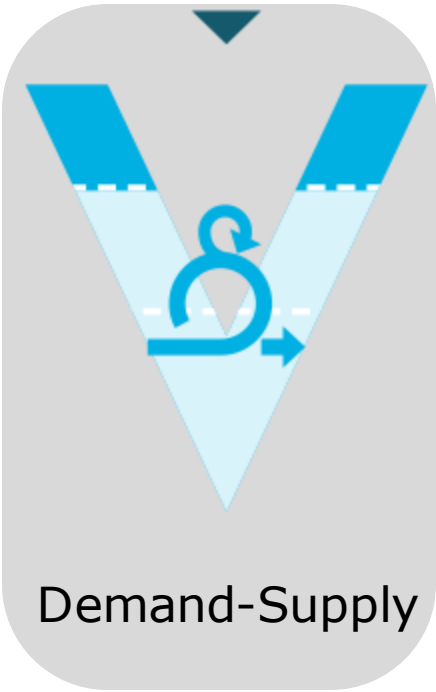
Waterfall

V-model

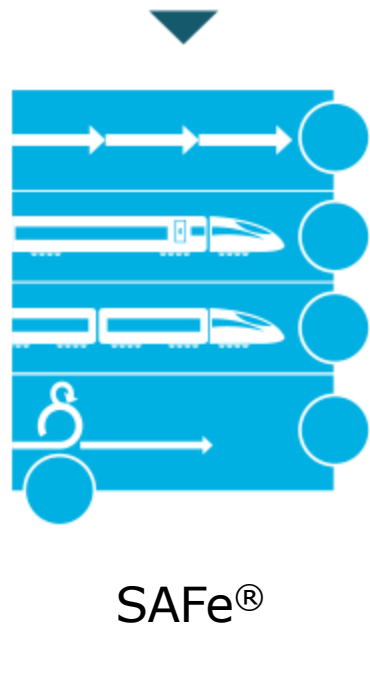


Scrum

DevOps



Demand-Supply



SAFe®

Grey = Often used in SAP

Figure 7.1 from the "Quality for DevOps"-book



# Demand/Supply model

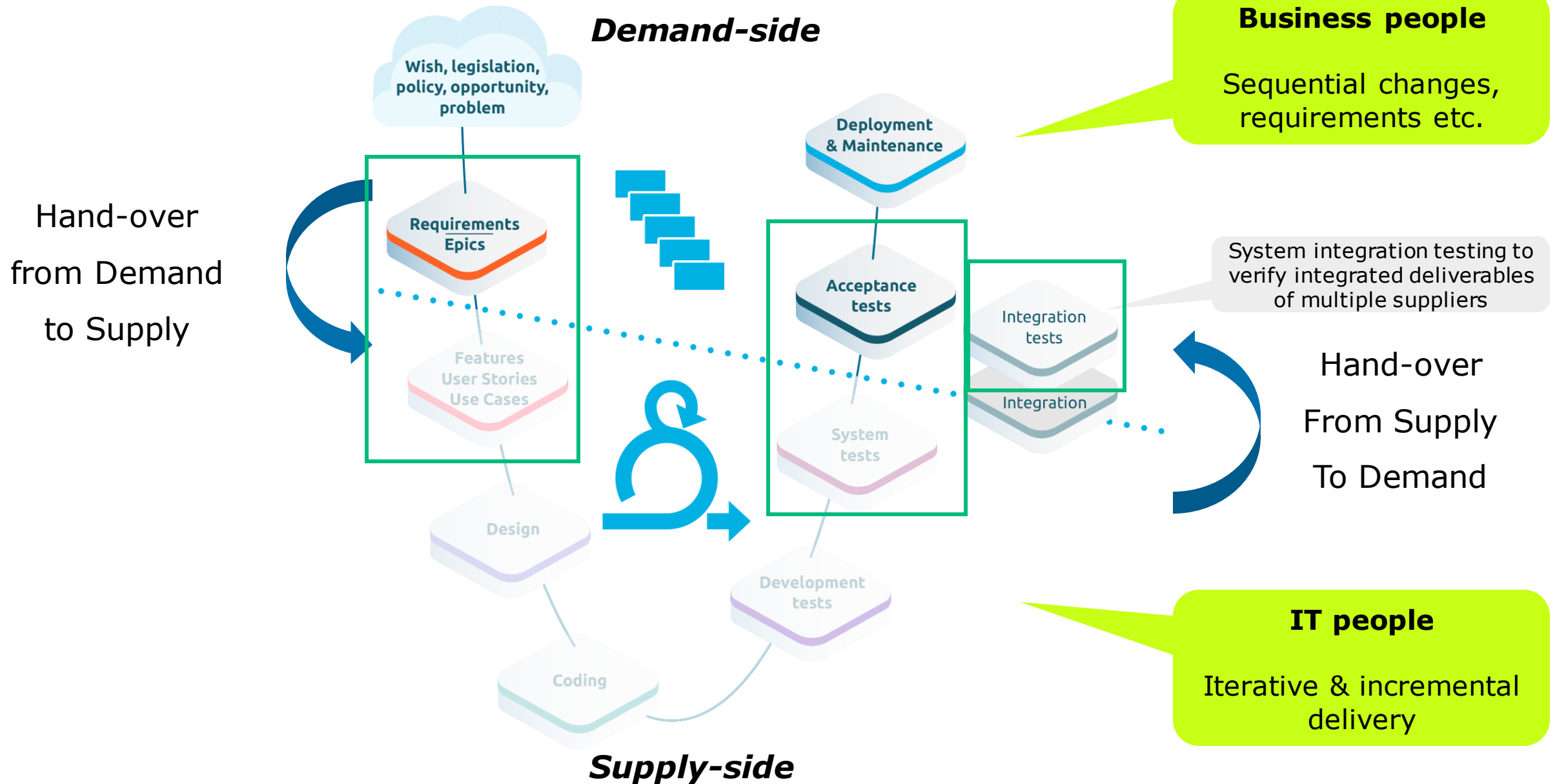


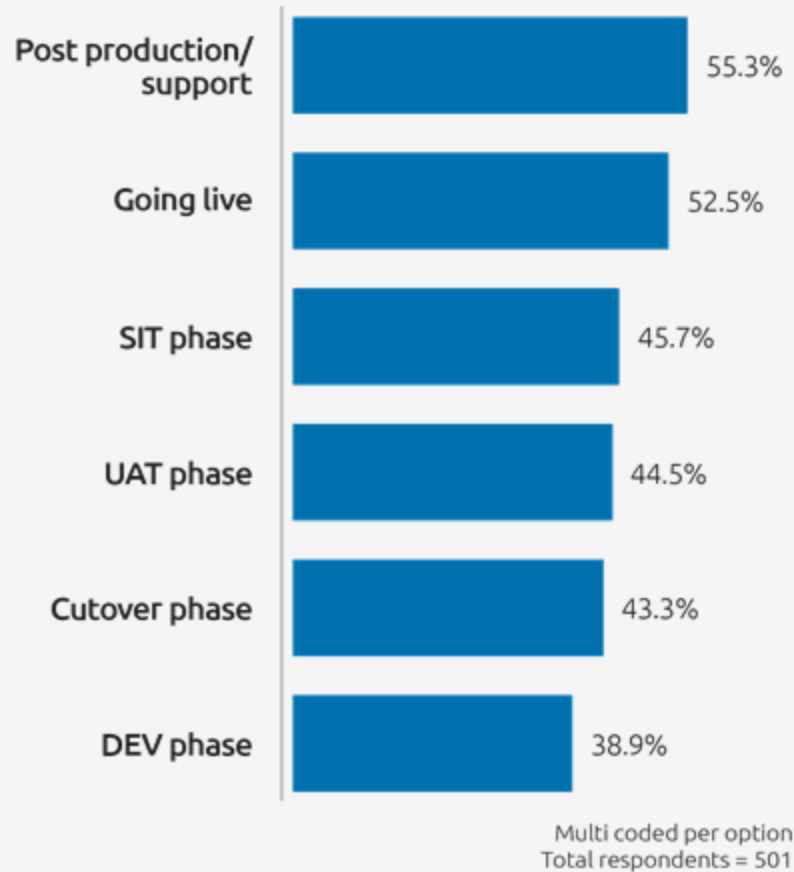
Figure 10.2 from the "Quality for DevOps"-book

## Section 3

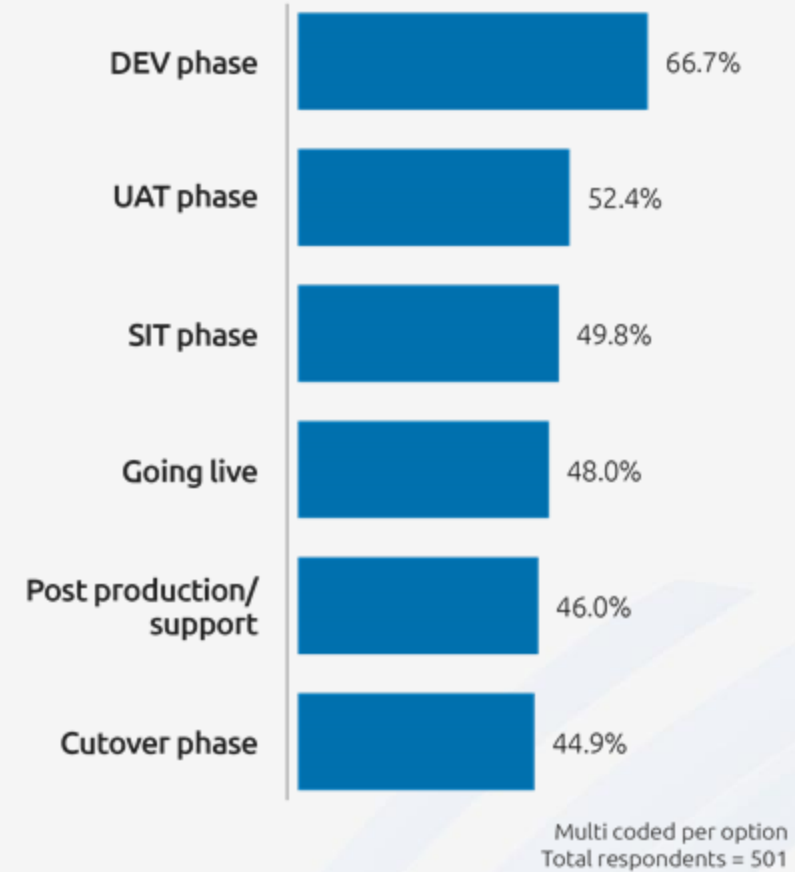
# SAP Business Assurance – Approach, Maturity, and Automation



# Shift left move still not mainstream

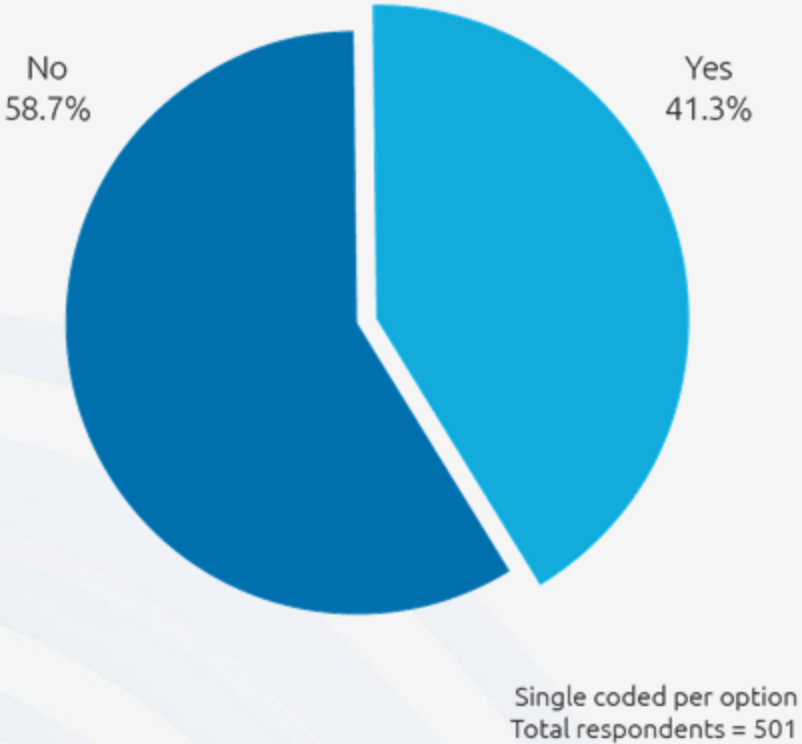


On a scale of 1-10 where 1 denotes minimal testing and 10 denotes comprehensive testing, please indicate the intensity/level of testing that your organization performs in each of the mentioned phases? Percentages are based on responses  $\geq 8$  (that indicated high intensity)

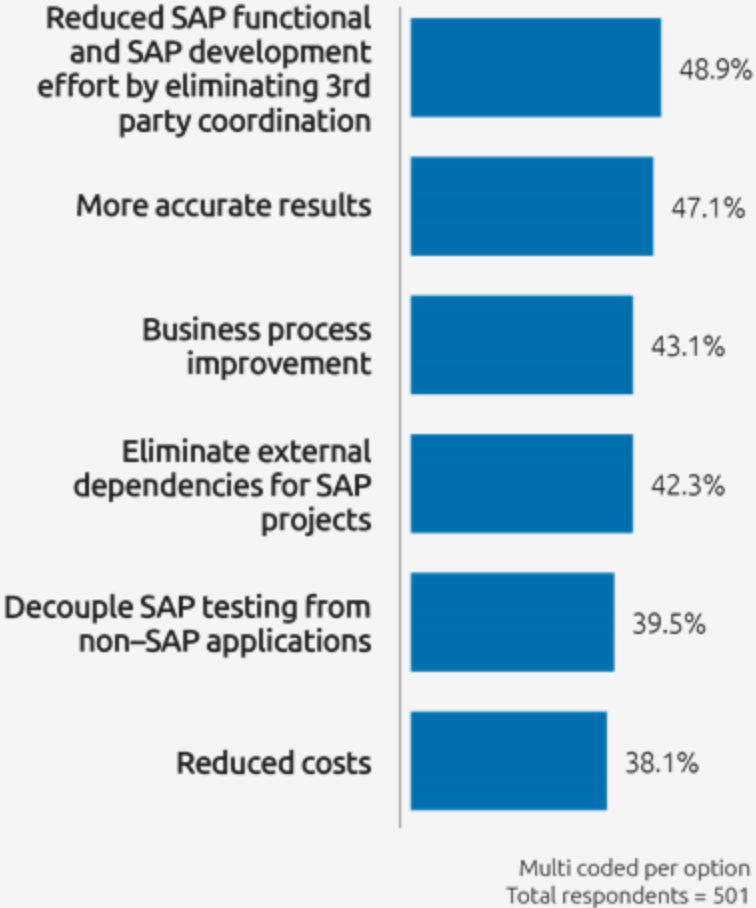


Does your organization plan to increase the intensity/level of SAP testing in the below mentioned phases in the next 12 months?

# Benefits of service virtualization are understood



Are you using service virtualization/simulation tools for automating your manual SAP testing processes?



What are the key benefits of using service virtualization/simulation in SAP testing process?

# Automation adoption increasing

- The percentage of organizations following a traditional/manual approach has decreased from 29.9% to 25.4%
- Of the organizations having complete or partial automation, 30.7% use automation throughout the entire SAP testing lifecycle
- Of the organizations having complete or partial automation, 41.4% of the respondents have embraced service virtualization/simulation tools to automate their manual SAP testing processes

“Automation adoption in testing is increasing, but most organizations prefer to use a combination of both manual and automated testing. This is because businesses are unaware of the potential commercial value that automated testing holds. Due to the high stakes and large costs associated with these projects, businesses feel pressurized to reduce costs, and most of them tend to do so by skimping on testing. However, it is expected to gain momentum in the coming years due to the evolving IT landscape across all kinds of organizations.”

— Global Director — Data Analytics, Enterprise Architecture, Strategy, and Digital Transformation at an automotive manufacturing company



# SAP Quality Risk Analysis (SQRA)



Where should we focus our quality engineering activities?

What should be priorities of performing tasks by team members?

## **Determine the quality risks!!**

- High risk → more effort
- Low risk → less effort
- No risk → no test & no dev!

The SAP Quality Risk Analysis achieves a joint view for all people involved.

- *IT and Business*

The test strategy defines the allocation of quality measures to make an optimal distribution of quality measures over test varieties and test approaches.

The test strategy gives insight in required test coverage and test intensity.

QRA can be used for Design and Execution priorities.

# Automated test execution in the CI/CD pipeline

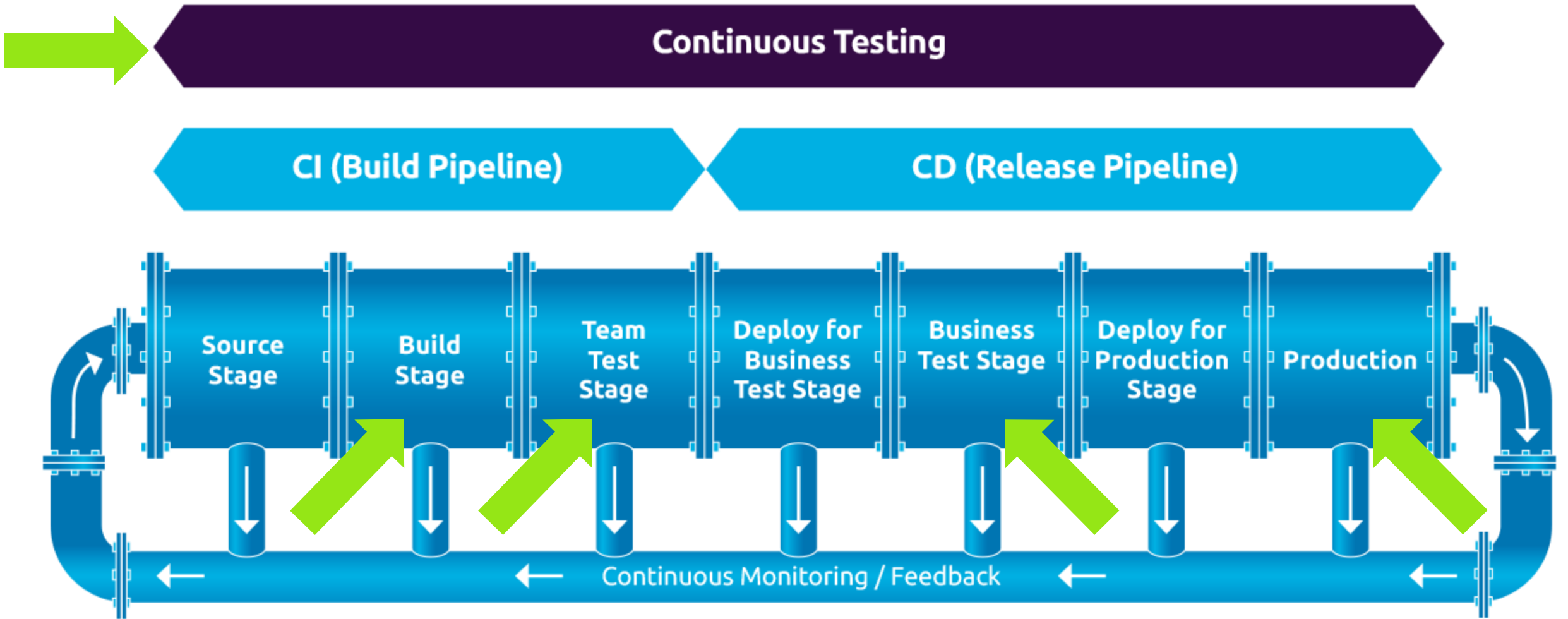
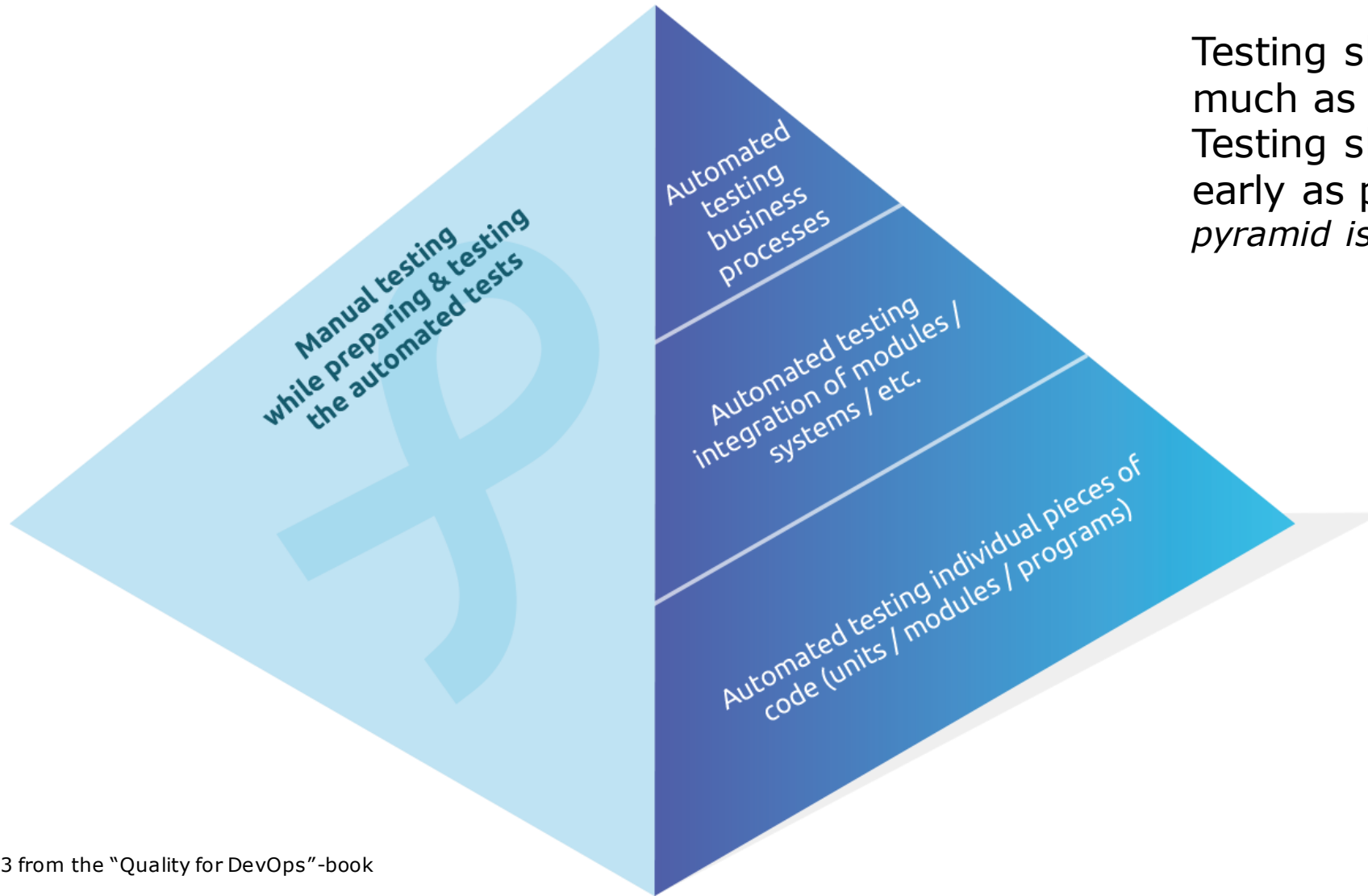


Figure 6.1 from the "Quality for DevOps"-book

# Automated testing: the testing pyramid



Testing should be automated as much as possible.  
Testing should be automated as early as possible (*which in the pyramid is from bottom to top*)





## Section 4

# Challenges in SAP Testing

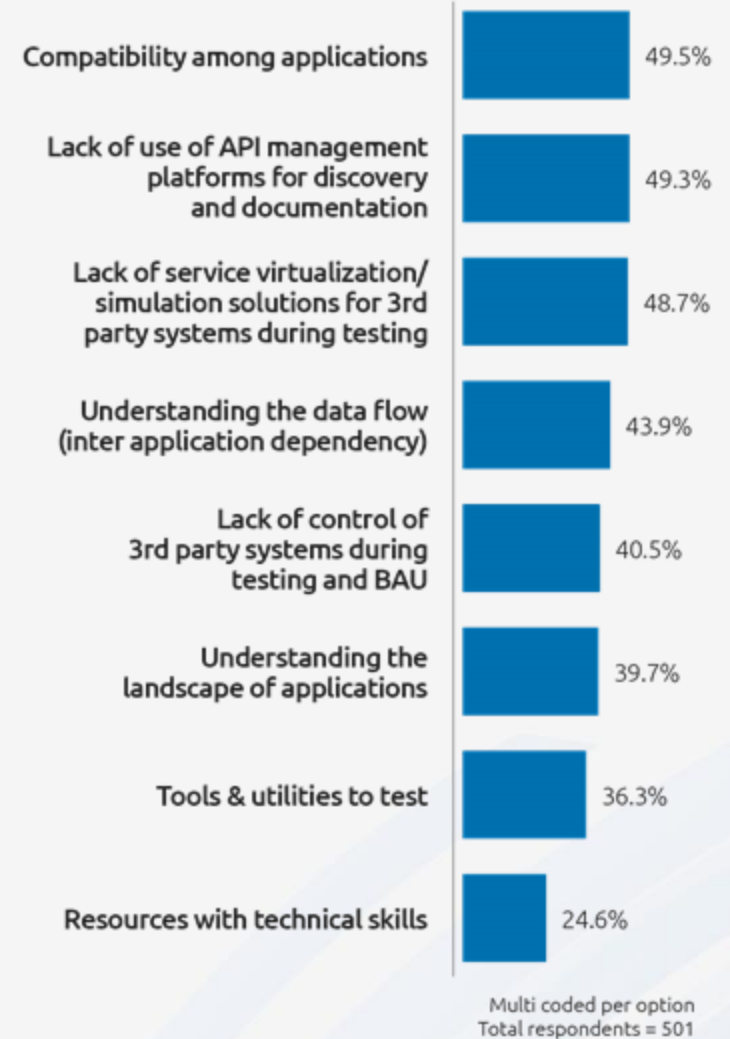


# Challenges in SAP Testing

- Data security (29.1%) and testing of cloud-native applications (28.5%) are the biggest challenges in implementing business assurance for SAP solutions/end-to-end testing services

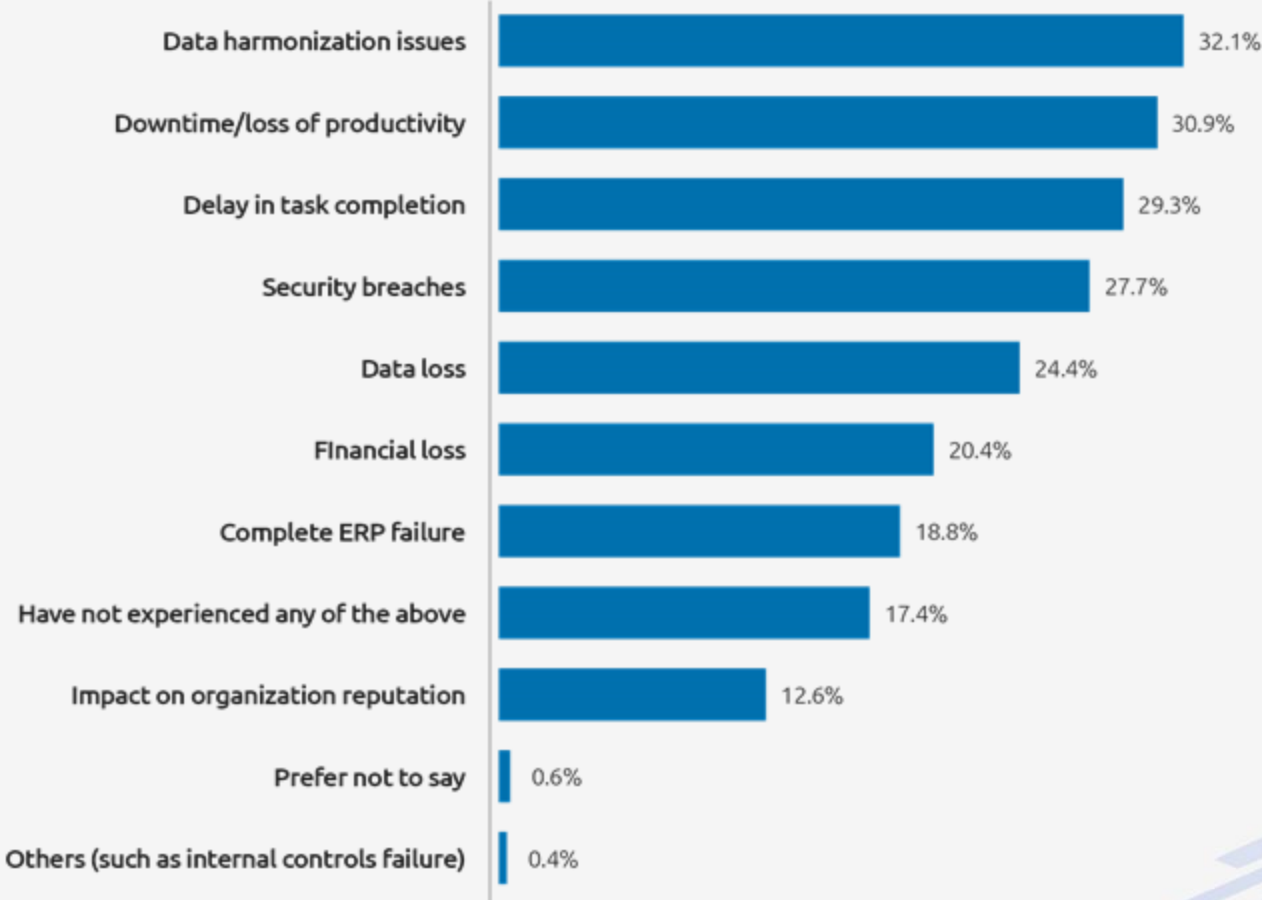
“Inefficient performance testing and lack of domain knowledge among the implementation team are the key challenges in business assurance/testing. Addressing these challenges through comprehensive performance testing methodologies and building a competent team with strong domain expertise is essential for successful SAP implementation.”

— Chief Information Officer at a leading energy company



What key challenges are being faced by your organization at the testing stage due to integration of SAP application with third-party non-SAP application, IOT devices, etc.?

# Consequences of lacking business assurance



Multi coded per option  
Total respondents = 501

As a result of inefficient business assurance/end-to-end testing processes, has your organization experienced any of the above?



# End-to-end testing: setting the scenes...

**End-to-end testing** is a specific test variety where the test object has a large scope. Often people project the test object of an end-to-end-test as a simple chain of systems.

Example of a simple chain of systems

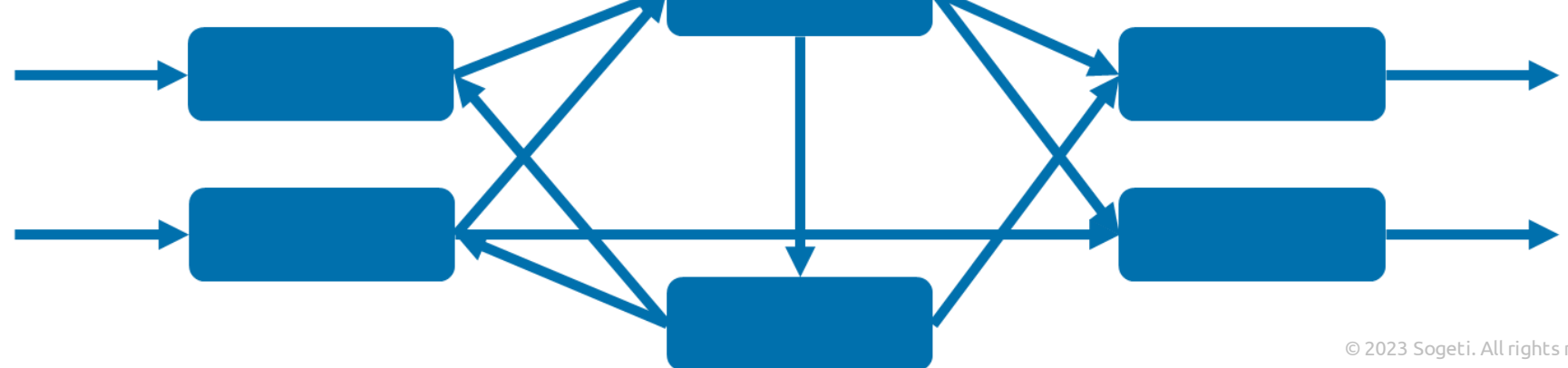


Example of a chain of systems



But in reality ...

Example of a **mesh** of systems



Or even ...

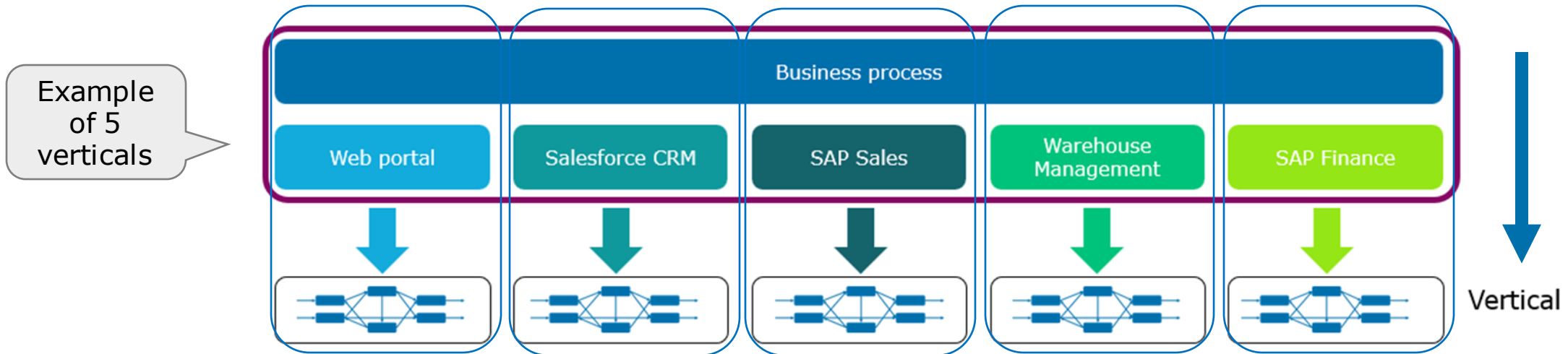
# ERP Metro Map

## How does a business work

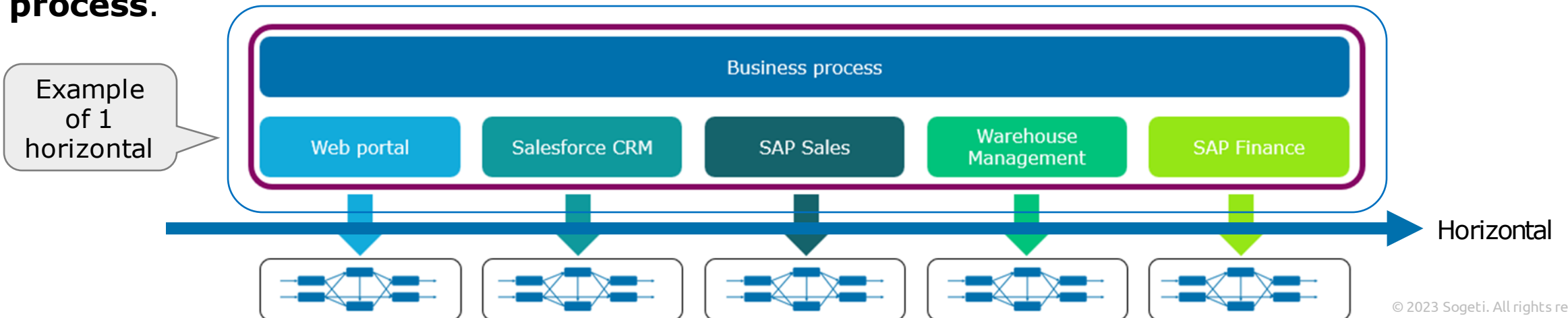


# End-to-end Testing: Vertical and Horizontal

**Vertical end-to-end test:** focus on E2E business processes **per system**. (Synonyms: Domains/ Modules/ Solution trains/ Streams/ Line of Business (LoB)/ 3<sup>rd</sup> Party/ Legacy)

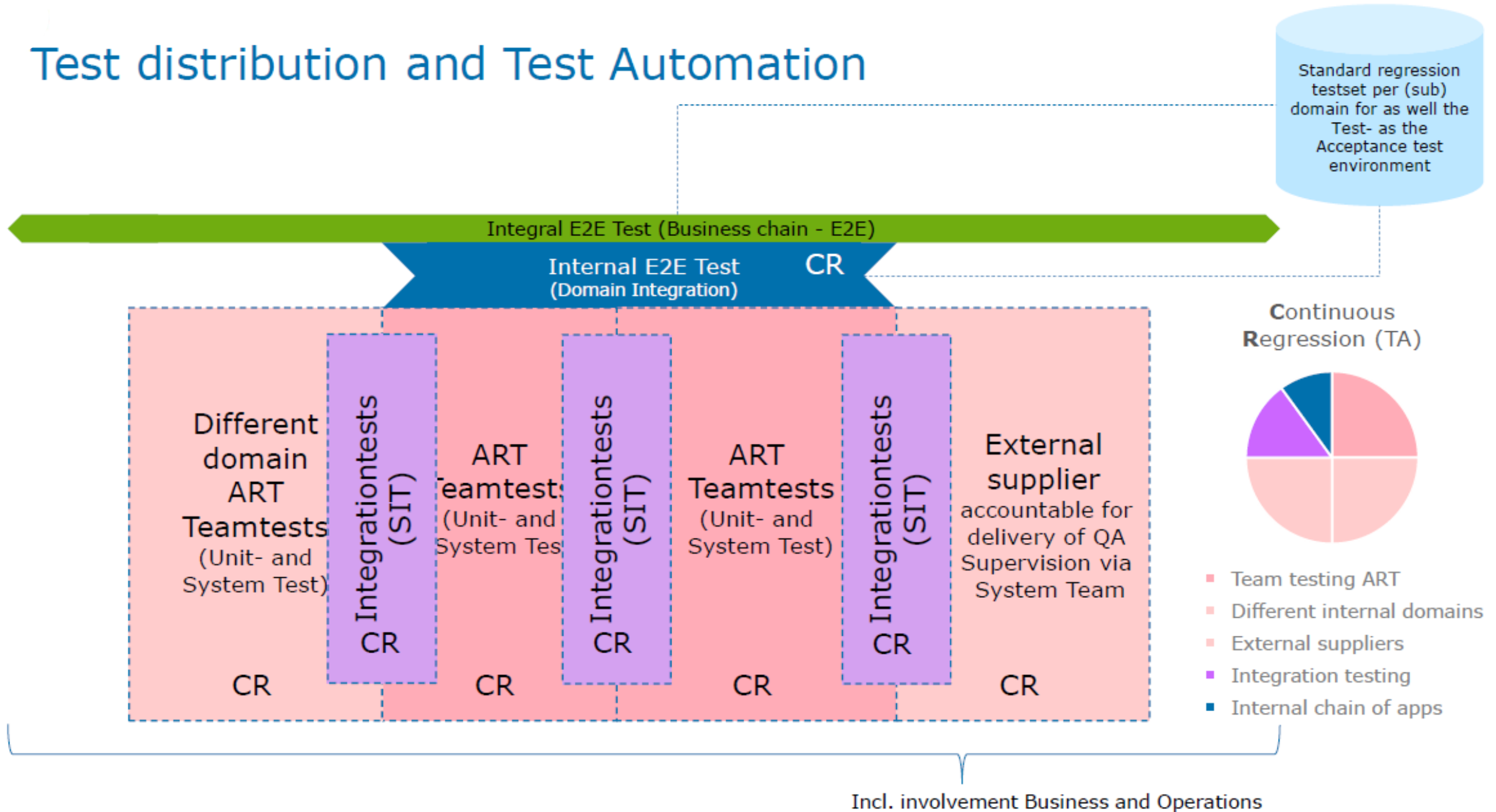


**Horizontal end-to-end test:** focus on multiple systems that together support one **business process**.





# Test distribution and Test Automation



**Client Case**

**SAP S/4HANA**

**Continuous Testing**

**Swedish Car Manufacturer**





# CLIENT CASE

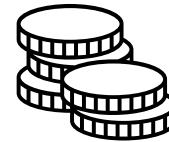


## THE CHALLENGE



### Time

In Agile, testing is becoming the number one impediment for digital innovation. Planning, preparing and executing regression testing can take up to three weeks and business is demanding releases faster and faster.



### Cost

The cost of E2E-testing is very high and involves a lot of planning and coordination with external teams and applications.



### Quality

Not running the regression testing or running the wrong testing is a risk of having major production disturbances for the business.



# JOURNEY TO CONTINUOUS TESTING



**Standard solution**  
Must have for structured approach  
with UI automation as a should have add-on

## S/4HANA Automation

- UI Automation
- Automate Test Data
- Continuous Maintenance

2

1

## Manual Structured Test

- Test Strategy
- Manual Test tool structure
- In sprint Automation approach
- SAP Agile Automation Framework
- Update S/4HANA implementation approach with Quality Assurance
- Establish Regression Baseline
- Operational Model

3

## E2E Automation

- Build Service Virtualization for inbound interfaces
- Build API Automation for outbound interfaces
- Identify integration scope

4

## Continuous Testing

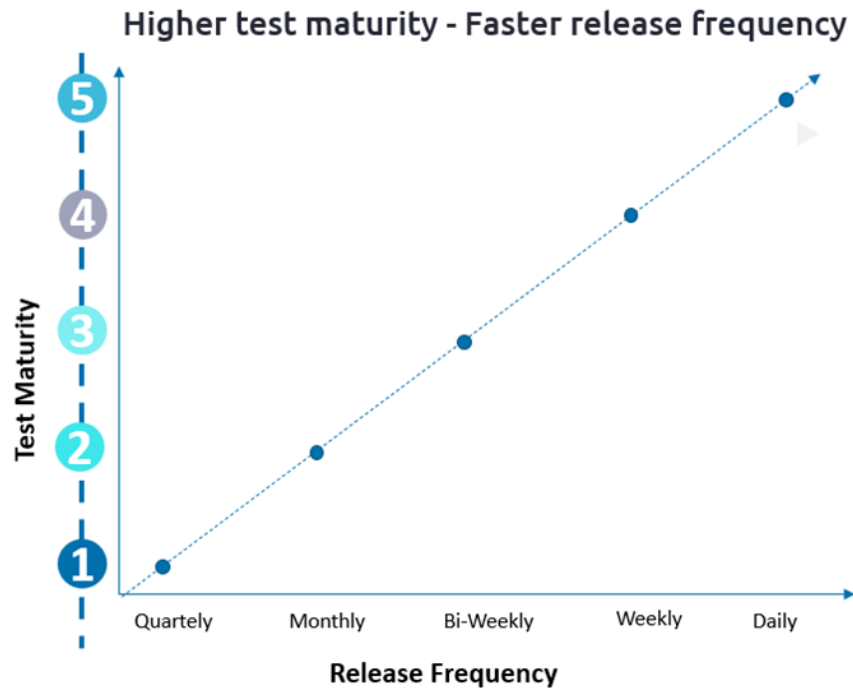
- Integrate with Azure DevOps pipeline and Tosca Distributed Execution (DEX) solution

**Advanced solution**  
Service Virtualization and API automation  
to solve E2E automation challenges

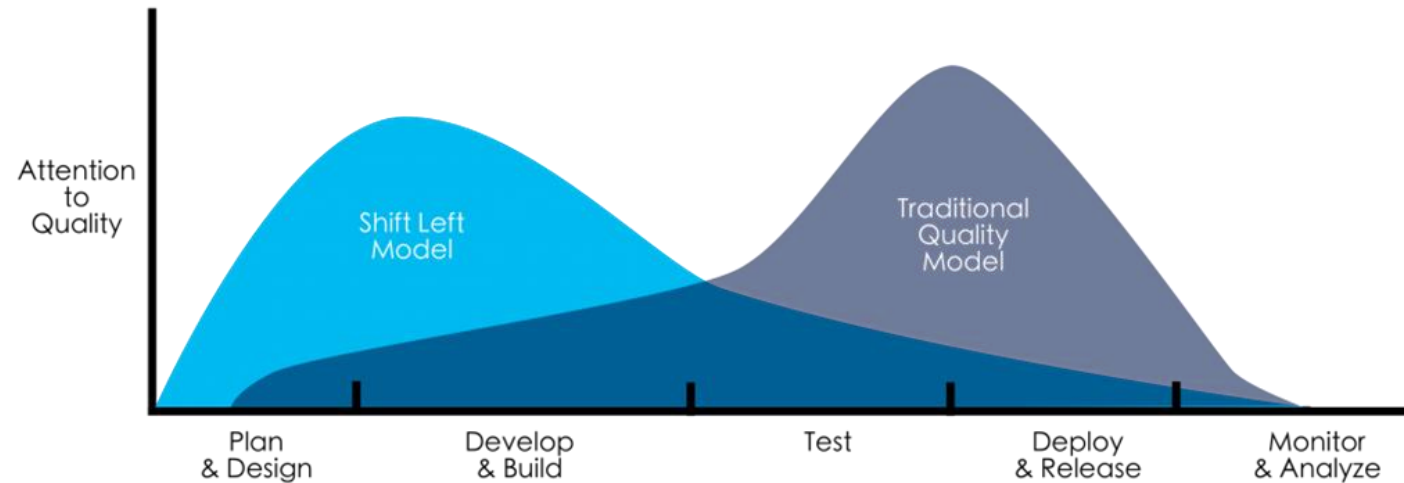


# TEST MATURITY ENABLES FASTER RELEASES

**Test maturity and release frequency are directly related.**



- Achieve higher test maturity / release frequency by:**
- Making quality everybody's responsibility
  - Shift left testing: TDD (test driven development)
  - Automate 'everything': unit, integration, functional, non-functional testing





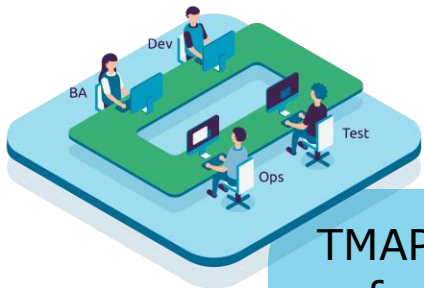
**TMAP®: the body of knowledge**

# **Quality Engineering for SAP**



# The certification scheme

[www.tmap.net](http://www.tmap.net)



TMAP: Quality for cross-functional teams

TMAP: High-performance quality engineering



TMAP: Organizing built-in quality at scale



2023

New

TMAP: Quality engineering for SAP



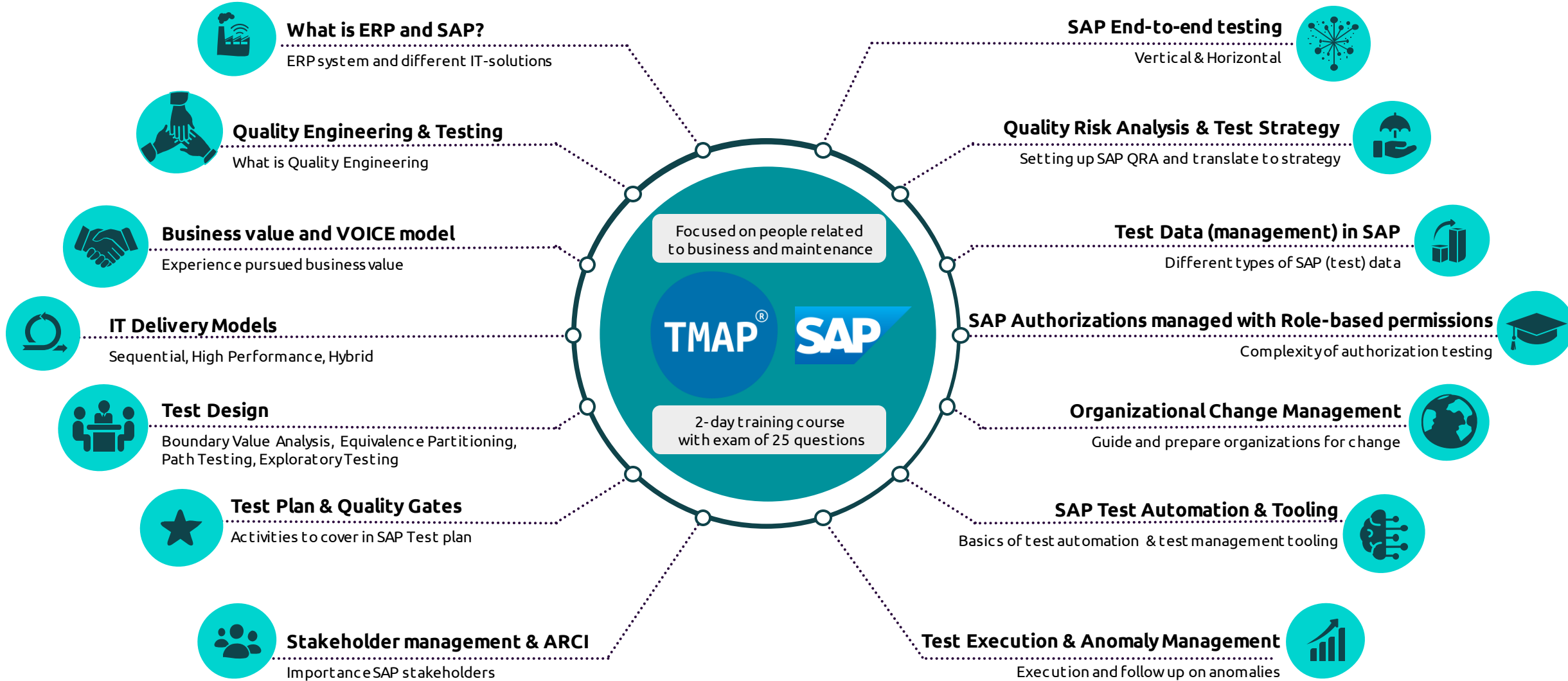
Focused on people in IT delivery teams

Focused on people related to business and maintenance

Info about TMAP training & certification at:  
[www.TMAP.net/page/tmap-training](http://www.TMAP.net/page/tmap-training)  
[www.TMAPcert.com](http://www.TMAPcert.com)

Exams provided by  **iSQI**  
SUCCESS IS YOURS

# "TMAP: Quality Engineering for SAP" – Wheel of Contents



# Key Learnings

Waterfall? DevOps?  
Agile? Hybrid?

Approach  
determines  
CI/CD/CT  
possibilities

Invest in "Shift Left"

Earlier involvement  
real users & benefits  
for testing

End users are  
essential in making  
realistic  
prioritization and  
risk estimation

Remember: SQRA

Test Maturity  
enables faster  
Releases

Continuous Testing  
improves this!

Want to explore  
Quality Engineering,  
Testing and SAP  
further?

Try "TMAP: Quality  
Engineering for  
SAP"!



Need more information?  
Feel free to contact us!  
[jeanine.hoogerbrug@sogeti.com](mailto:jeanine.hoogerbrug@sogeti.com)  
[stefan.gerstner@sogeti.com](mailto:stefan.gerstner@sogeti.com)



Questions are welcome!