Capgemini

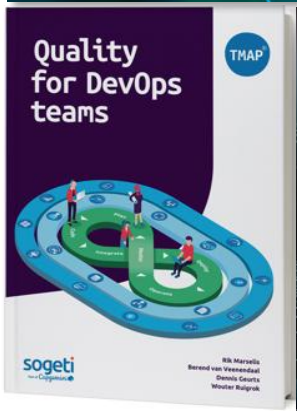
AI POWERED QUALITY

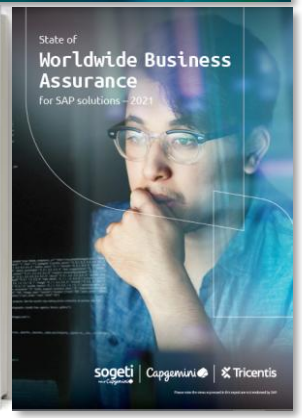
March 2025

QUALITY ENGINEERING AND TESTING PRACTICE

Industry Recognised Thought Leader in Quality Engineering

TMAP® TPI®





Gartner

NelsonHall

Everest Group®

FORRESTER

ISG Provider Lens™

CIMdata

>35.000 dedicated professional Quality Engineers

900+ customers across 25 countries

Strong local presence in US & Europe, Global Test Delivery Centers

Breadth of quality engineering offerings

150+ assets, accelerators to drive agility & speed

Strategic Partners

Microsoft | Tricentis | opentext | UiPath
headspin | KEYSIGHT | BrowserStack | INT4
COPADO | appvance | Azure | aws

Solution Partners

SMARTBEAR | NEOTYS | BROADCOM | perfecto mobile
leapwork | applitools | WORKSOFT | Katalon
AppDynamics | LAMBDATEST | SauceLabs | digital.ai

Industry focus

Consumer products, Retail & Distribution
Telecom, Media & Technology
Public Sector
Energy, Utilities & Chemicals
Healthcare & Insurance
Financial Services
Manufacturing, Automotive & Life Sciences


Heuristics Based
Testing

EVOLUTION APPROACH TO QE THROUGH AI & GENAI

Our key solutions using ai in quality engineering

CCQA, CQA

- Near real-time view of project health
- It not just tells us “what’s going on”, but also enables decision making through prescriptive and predictive analytics
- 360◦ integrated view of quality
- AI/ML based analysis, 200+ use cases
- Sentiments, feedback and tickets analysis and insight driven decision making
- Information at project and governance level

Self-Healing Test Automation

- Self diagnosing and healing ability to find locator reference for updated Web pages
- Use NLP Algorithm to identify change in Web page objects
- Long term automation strategy with right tools and framework
- Reduced script maintenance on change in object locators
- Improved automation E2E stability

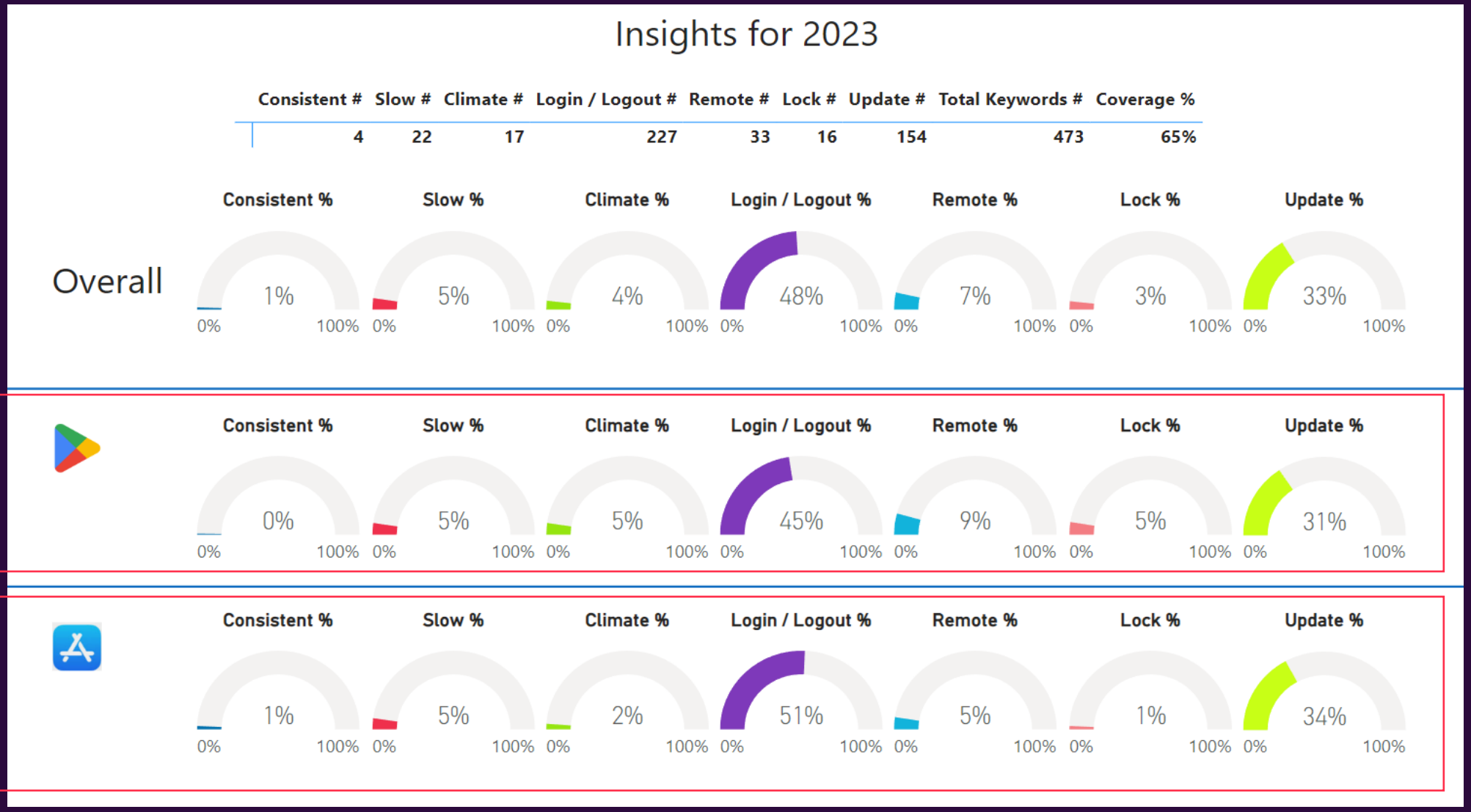
Gen AI Amplifier

- Use cases identification based on productivity impact and efforts analysis
- Test cases generation
- Automation/Performance/APIs scripts generation
- API Code to documentation to test cases generation
- Defects analysis

CUSTOMER CENTRIC QUALITY VALIDATION(CCQV)

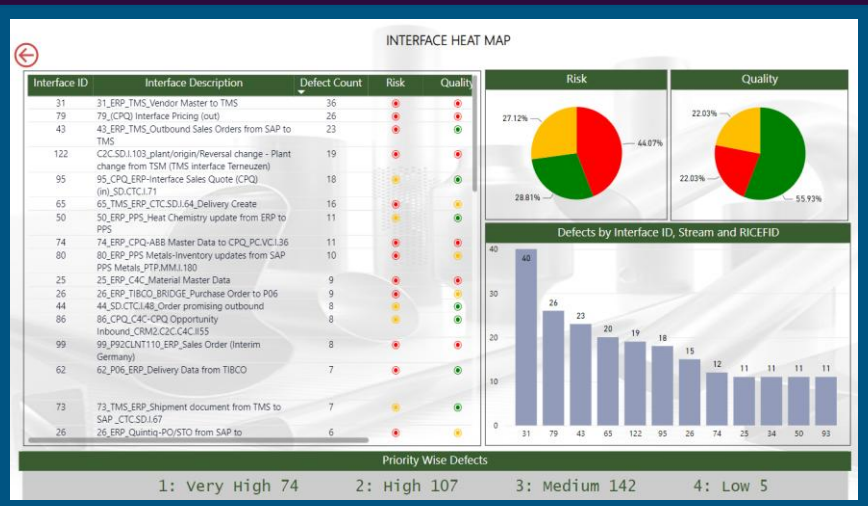
PROBLEMS REPORTED BY CUSTOMERS | THESE INSIGHTS ARE MAPPED TO QUALITY ENGINEERING PRIORITIES

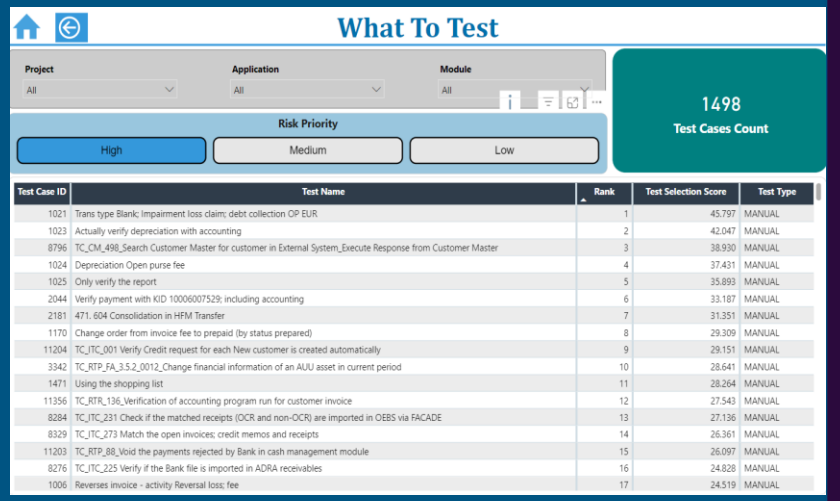
- SMART building
- Gas Detection
- SMART Meters
- Healthcare devices
- Wearables
- EV Charging setup
- Connected cars

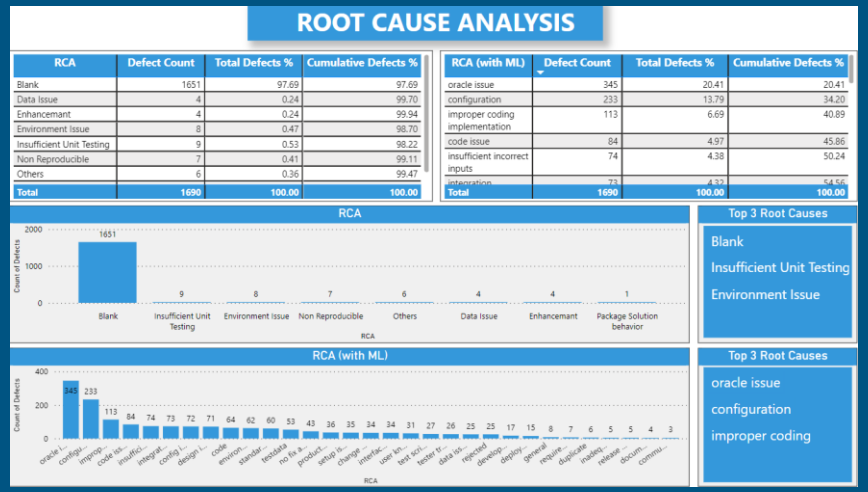


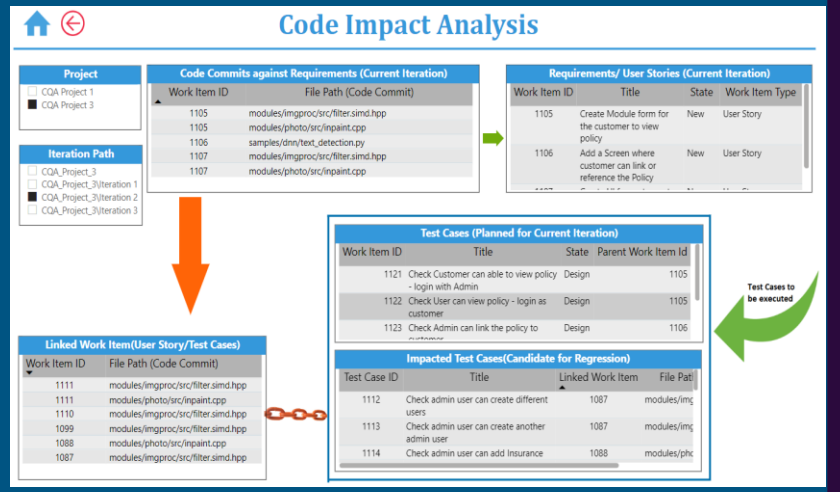
PRESCRIPTION BASED TESTING THROUGH CQA

CQA









AI Use cases

- Risk Impact analysis and execution
- What to test
- What to automate
- Root cause analysis
- Code impact analysis
- Requirements traceability
- Duplicate defects and test cases identification
- When to stop testing
- Business process/ test cases to defects mapping

Cognitive QA®: SINGLE VIEW OF QUALITY

CAPGEMINI OPEN-SOURCE TOOLS-BASED COGNITIVE BASED DASHBOARD AND RISK TESTING

Our Cognitive QA solution fits in any tooling ecosystem and intelligently collects "near real time" data from the test management tools. It then shares in-depth analytics, helping the stakeholders take fast, data-driven decisions

360° integrated view of quality

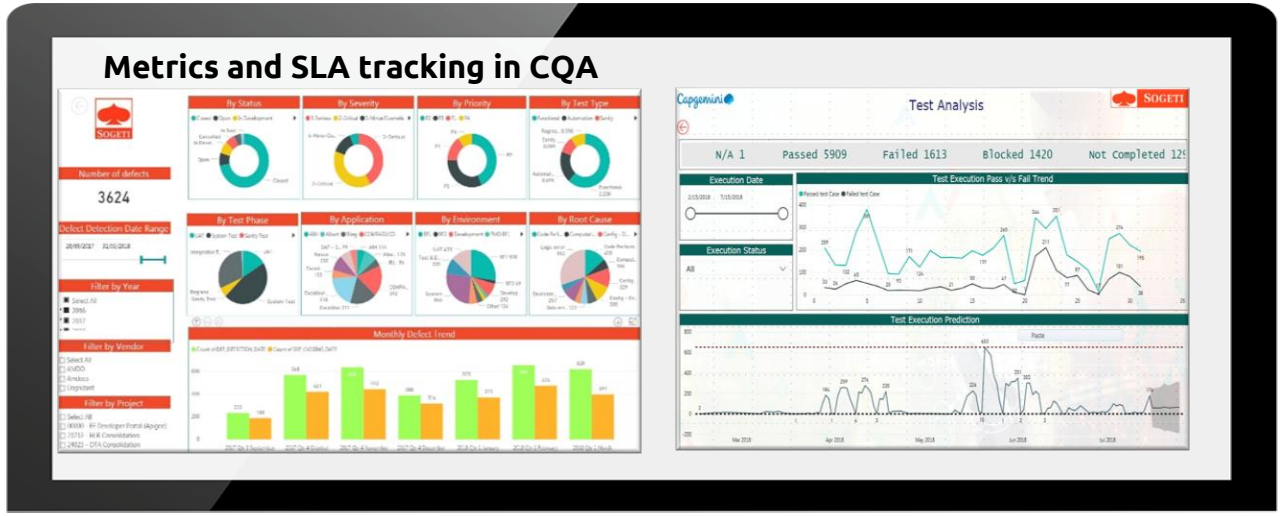
01

02 Provides all the required test metrics, SLAs/KPIs data

03 AI/ML based analysis, 200+ use cases

04 Information at project and governance level

For a critical landscape like Dell, Cognitive QA is a perfect solution and offers excellent, near real-time view of the entire platform. It not just tells us "what's going on", but also enables decision making through prescriptive and predictive analytics



WHAT IS HAPPENING NOW?	WHAT SHOULD WE DO?	WHAT IS GOING TO HAPPEN?
Test coverage %	What to test	Defect prediction
Orphan test cases	What to automate	Defect Turn-Around Time
Open critical defects	Test case selection	Test Coverage
Productivity	When to stop testing	Test Effort Prediction
DESCRIPTIVE	**PRESCRIPTIVE**	**PREDICTIVE**

SELF HEAL

Problem Statement - Test Script Maintenance

- Updates in Web application for every sprint requires change in object locators
- Test script maintenance becomes tedious and repeated task due to change in application
- Significant effort goes in script maintenance, rather than increasing automation coverage
- Unstable automated E2E test suite impacts CI execution and confidence in automation

Solution - Self Diagnosis and Heal Object

- Self diagnosing and healing ability to find locator reference for updated Web pages
- Use NLP Algorithm to identify change in Web page objects
- **Standalone Library file** - Python based for Robot framework project
- **Healenium** – opensource framework extension for Selenium - java
- Easy to extend for other framework & programming languages

Benefits

- Long term automation strategy with right tools and framework
- Asset creation and reuse
- Reduced script maintenance on change in object locators
- Improved automation E2E stability
- Significant cycle time reduction (15%)
- Reduced automated script maintenance effort (15-20%)

Our Assets with Self-Heal

RAAFT – BDD/ATDD Robot Framework Self –Heal

Robot framework · Selenium · python

LITMUS – BDD Selenium Java + Self-Heal

Healinium · Selenium · Java

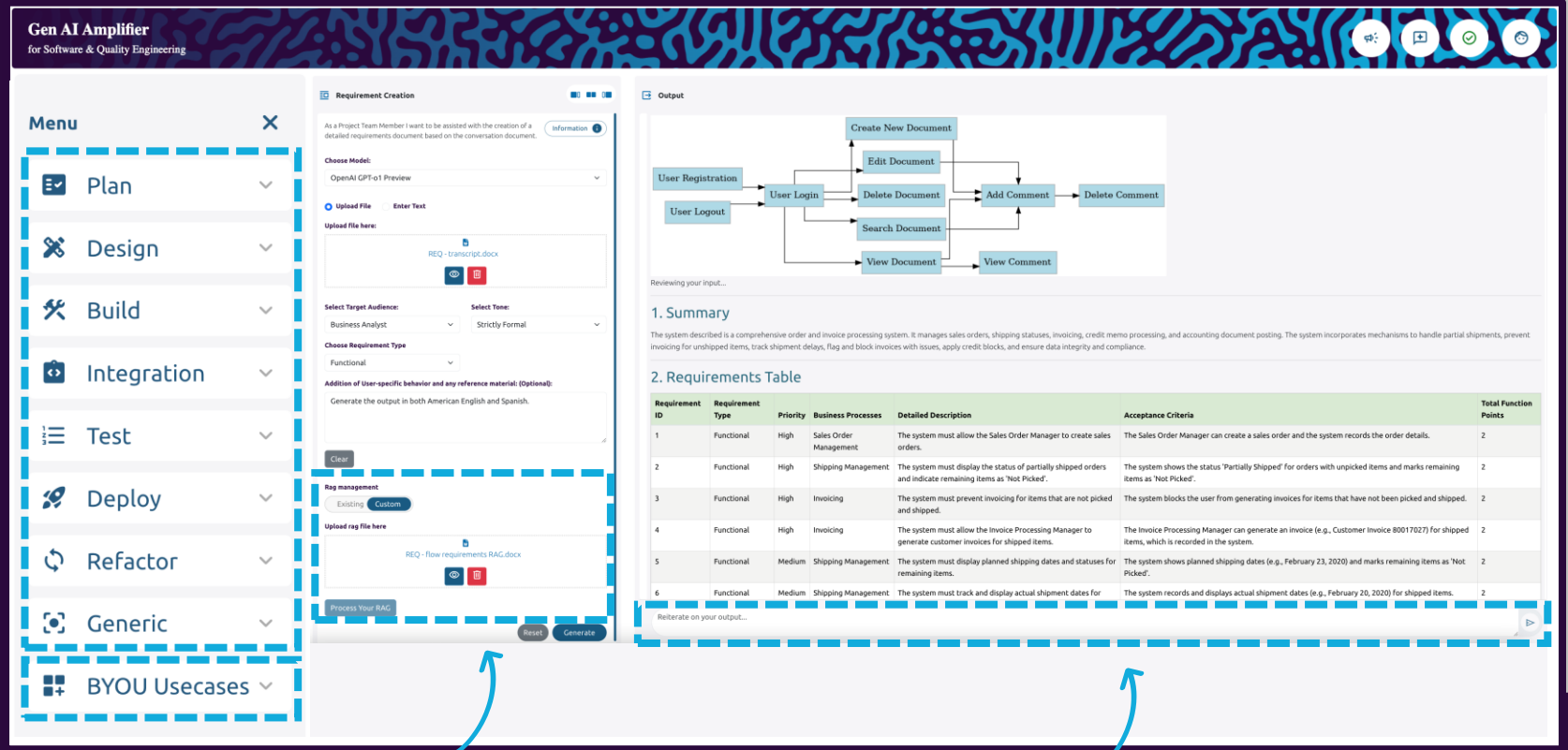
GENERATIVE AI AMPLIFIER for Software & Quality Engineering

Homegrown Accelerator of Services

Ready-to-use

Fortified

60+ use cases



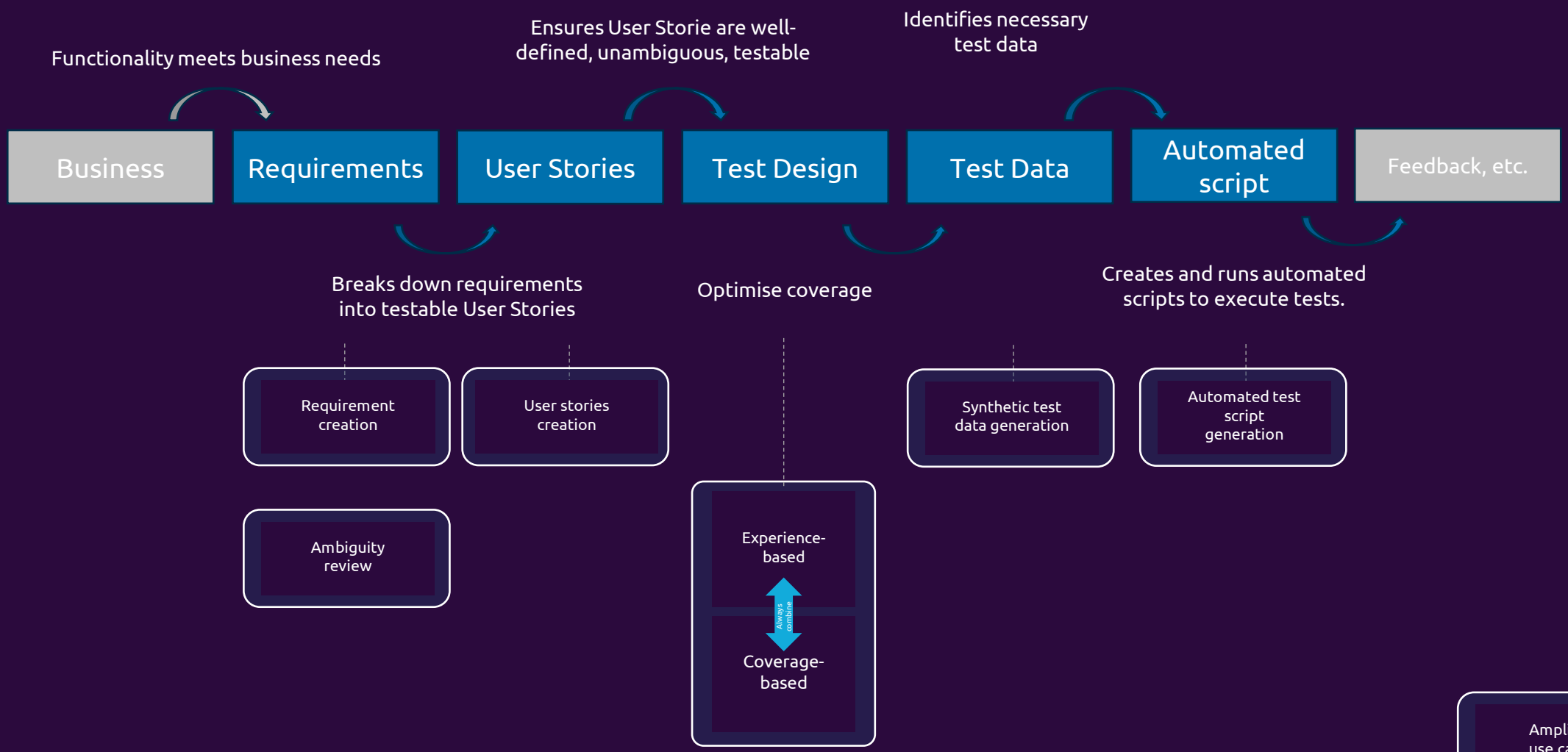
Cloud native
LLM agnostic
Authentication
Data privacy
Guardrail
Cost control
User management
Integration

Bring-your-own-use-case

Knowledge System (RAG)

Output versioning
Low prompt no prompt

GENERATIVE AI AMPLIFIER for Software & Quality Engineering



*Simplified view, depends on context

PRODUCTIVITY IMPACT IS HIGHEST WHEN AMPLIFIER IS USED END TO END

POV Example	Input	Output	Manual Effort	Gen AI Amplifier			Savings
				Pre-Process Effort [A]	Post-Process Effort [B]	Total Effort [A + B]	
1.	User Stories	Test Cases	11h27	5h27	3h43	9h10	20%
2.	User Stories	Test Cases	41h40	21h	12h20	33h20	20%
3.	User Stories	Test Cases	12h30	1h47	6h05	7h52	37%
4.	Transcript	Requirements	16h00	0h30	6h00	6h30	59%
	Requirements	User Stories	8h00	0h18	4h00	4h18	46%
	User Stories	Test Cases	10h13	1h23	4h45	6h08	40%
	Test Cases	Katalon Test Scripts	24h00	3h00	12h00	15h00	38%

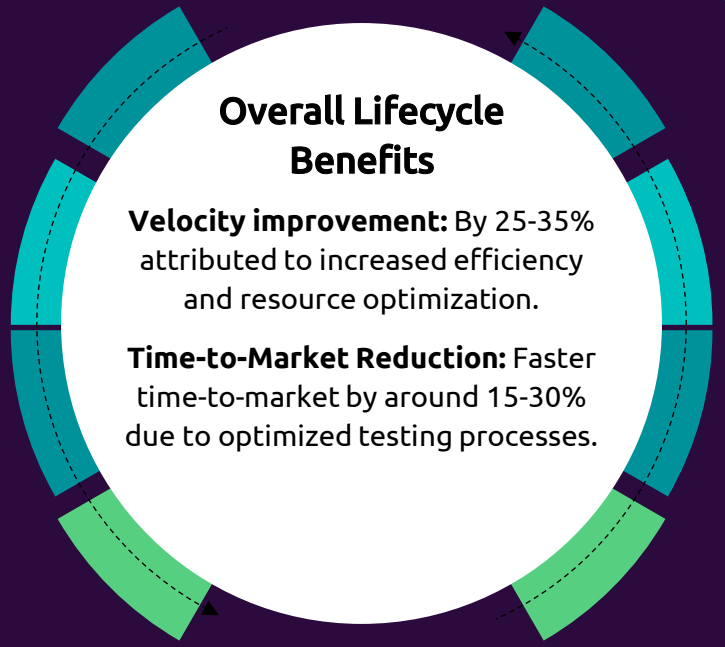
PRODUCTIVITY IMPACT IS HIGHEST WHEN AMPLIFIER IS USED END TO END

Test Design
- **Reduction in Test Design Efforts:** Up to 30-50%
- **Increased Test Coverage:** ~20-40% additional coverage

SAP Testing
- **Reduction in Design and Execution Efforts: ~** 25-40%

API Testing
- **Automation and Test Efficiency:** ~ 20-40% efficiency gains in scripts generation

Data Generation
- **Diverse and Realistic Data Generation:** ~20-35% improvement



Overall Lifecycle Benefits

Velocity improvement: By 25-35% attributed to increased efficiency and resource optimization.

Time-to-Market Reduction: Faster time-to-market by around 15-30% due to optimized testing processes.

Test Automation
- **Efficiency Gains in Automation~**20-40% in scripts development

Performance Testing
- **Efficiency Gains:** 20-40% in generating and simulating diverse load scenarios.
- **Faster Analysis of Bottlenecks:** Reductions in time by around 25-40%.

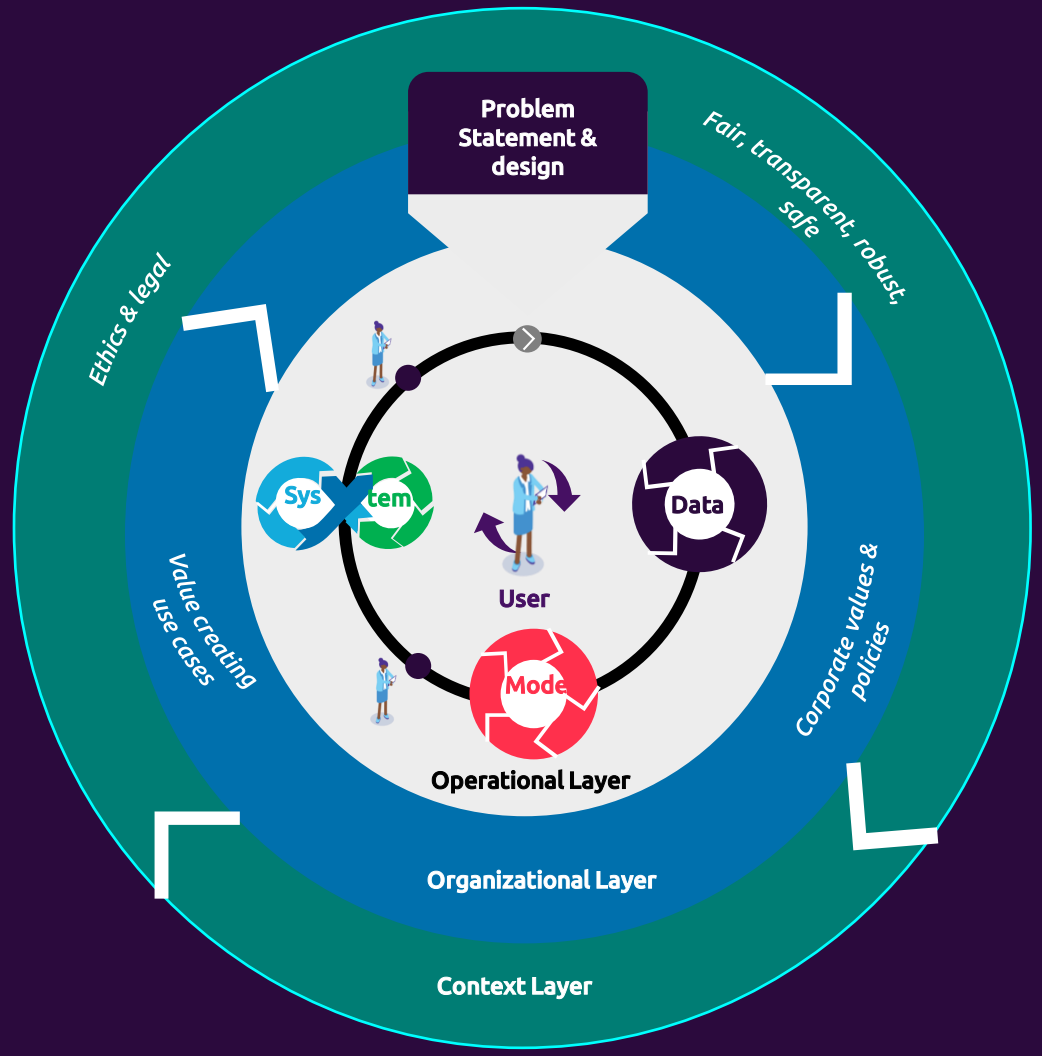
Requirements Analysis
- **Efficient requirements validation:** ~10-15% of efforts saving in analyzing the gaps

Data Testing
- **Efficient Test Scripts Generation:** ~ 20-35% improvement

These estimations are approximate and based on potential improvements observed in controlled environments. Actual benefits may vary significantly based on specific project contexts, tool implementations, system complexities, and the expertise in utilizing Generative AI across the testing lifecycle. Quantifying actual benefits would require detailed measurement and analysis in real-world testing scenarios.


Trusted AI
Framework

TRISM



- Trusted AI Framework is a cohesive, generic framework applicable to all layers of AI and Generative AI solutions
- The framework is governed by the EU ethics principles & our group code of ethics:
  - AI with delimited impact
  - Sustainable
  - Fair
  - Transparent and explainable
  - Controllable and accountable
  - Robust
  - Respectful of privacy and data protection
- The framework employs Human In The Loop (HIL) method in all the modules to ensure a human(user) centered approach

TRUSTED AND RESPONSIBLE AT ALL LEVELS

Data

Handling PII | Toxicity | Bias | Standardization

Vector DB Update
Benchmark update
Monitoring

Accountable: **Data Engineer** | **Gen AI Architect** | **Data Scientist**

Responsible: **Product Owner** | **Security SME**

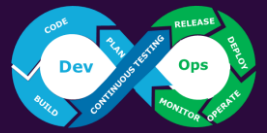
Model

Model Performance | Bias | Robustness

Model evaluation
Benchmark update
Monitoring

Accountable: **ML Engineer** | **Gen AI Architect**

Responsible: **Test Manager**



System

UAT | Drift | LLMOps

Model evaluation
Benchmark update
Monitoring

Accountable: **ML Engineer** | **Gen AI Architect** | **Cloud Architect**

Responsible: **Test Manager** | **Security SME** | **Cloud Engineer**

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