

# Research Paper Presentation

</>Title

**“Practices of Software Testing Techniques and Tools in  
Bangladesh Software Industry”**

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# Agenda

- Introduction
- Why This Topic Matters
- Objectives of the Paper
- Background (Global Research)
- Gap in Bangladesh
- Survey Design
- Key Metrics Collected
- Correctness Testing Usage
- Functional Testing Usage
- Non-functional & Security Testing
- Automation Tool Usage
- Bug/Defect Tracking Tools
- Challenges Identified
- Recommendations

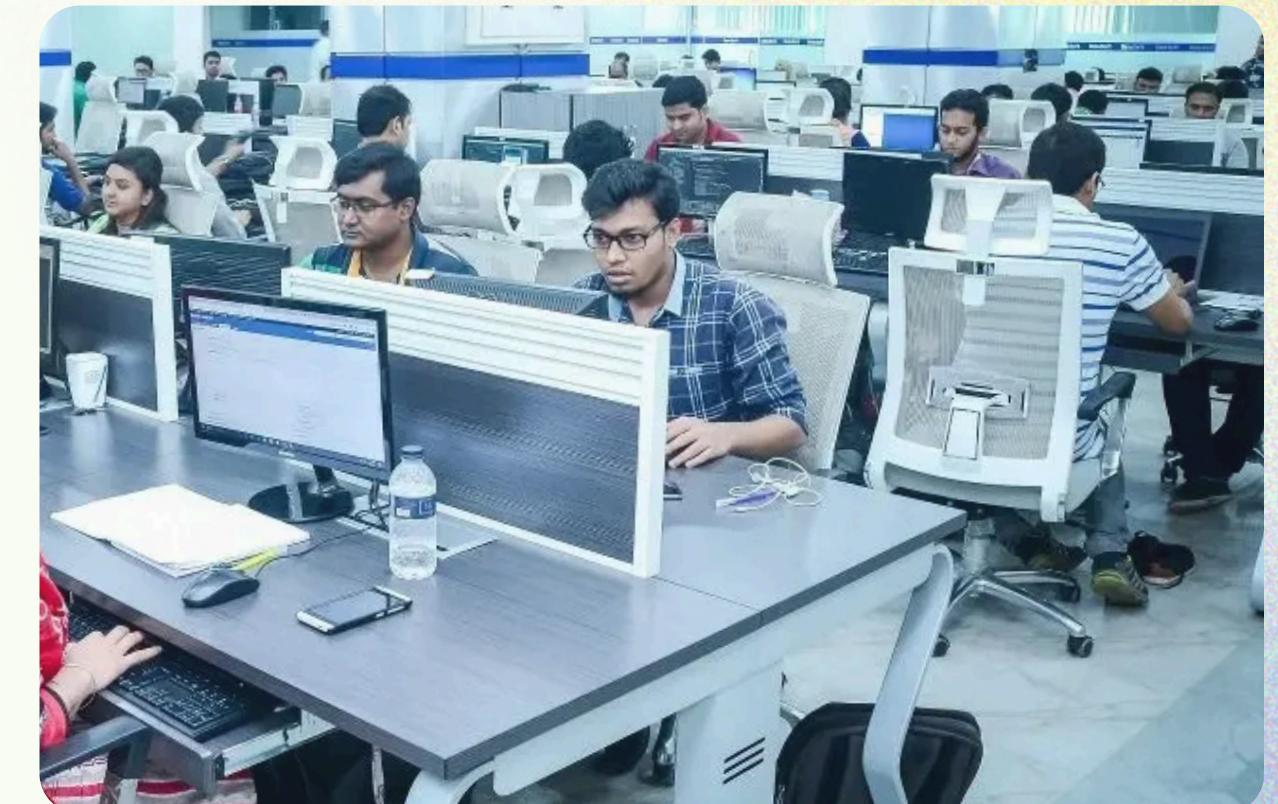
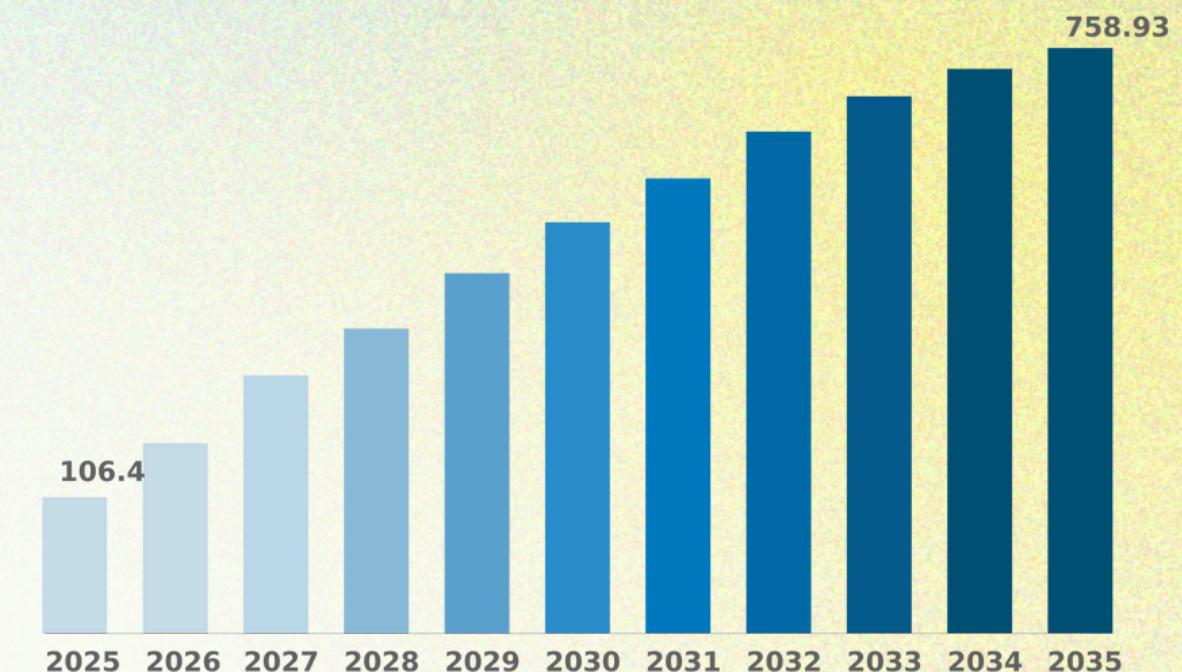
# Why This Topic Matters

- Quality testing = essential for global competitiveness
- Manual → Automation trend rising globally, but
- Bangladesh still lags in automation usage



- BASIS report: \$800 million software export (6720 crore)
- High-quality software is essential for:
  - Sustainable IT industry growth
  - Reducing defects & failures

Global Software Testing Market Size, 2035 (USD Billion) 

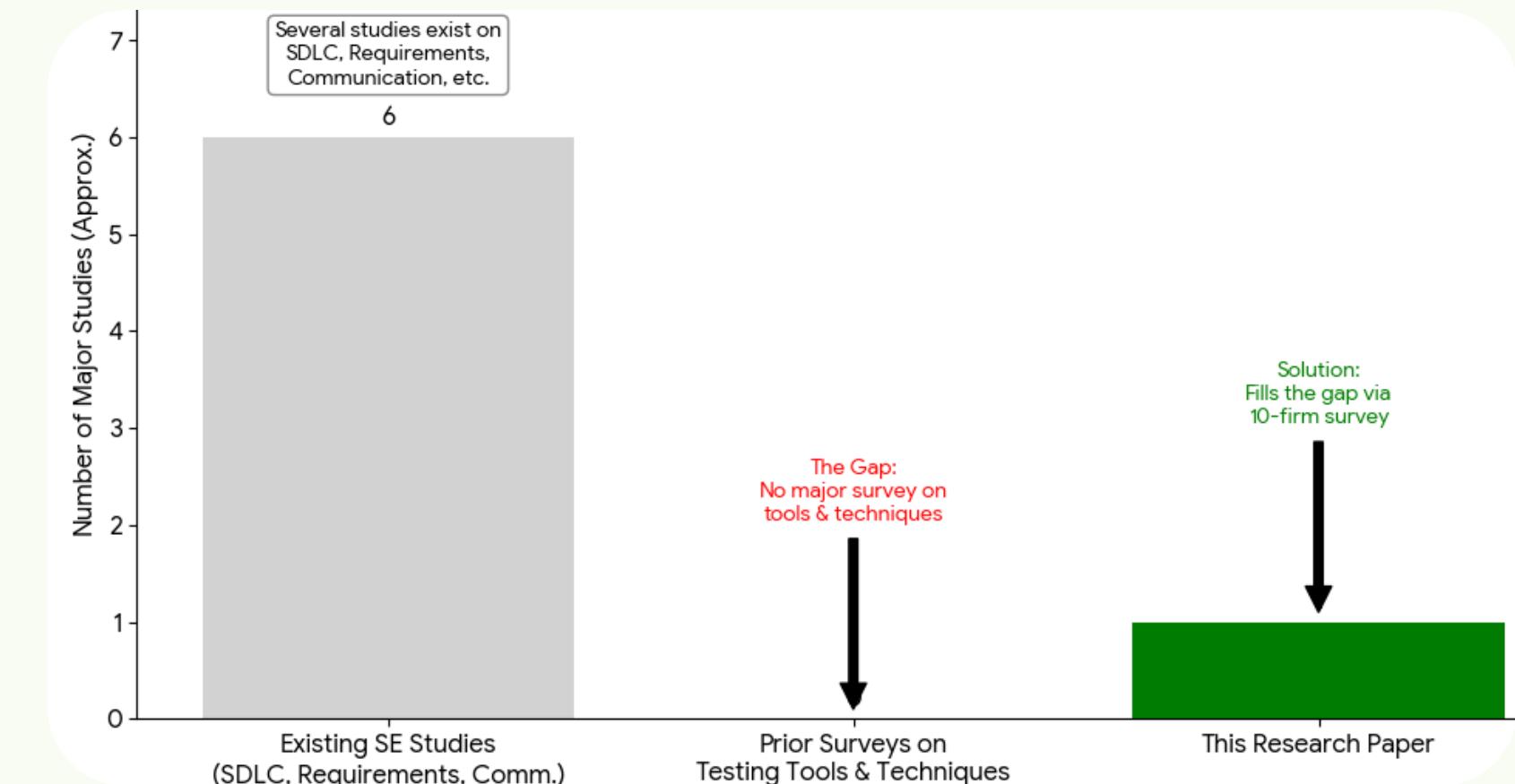
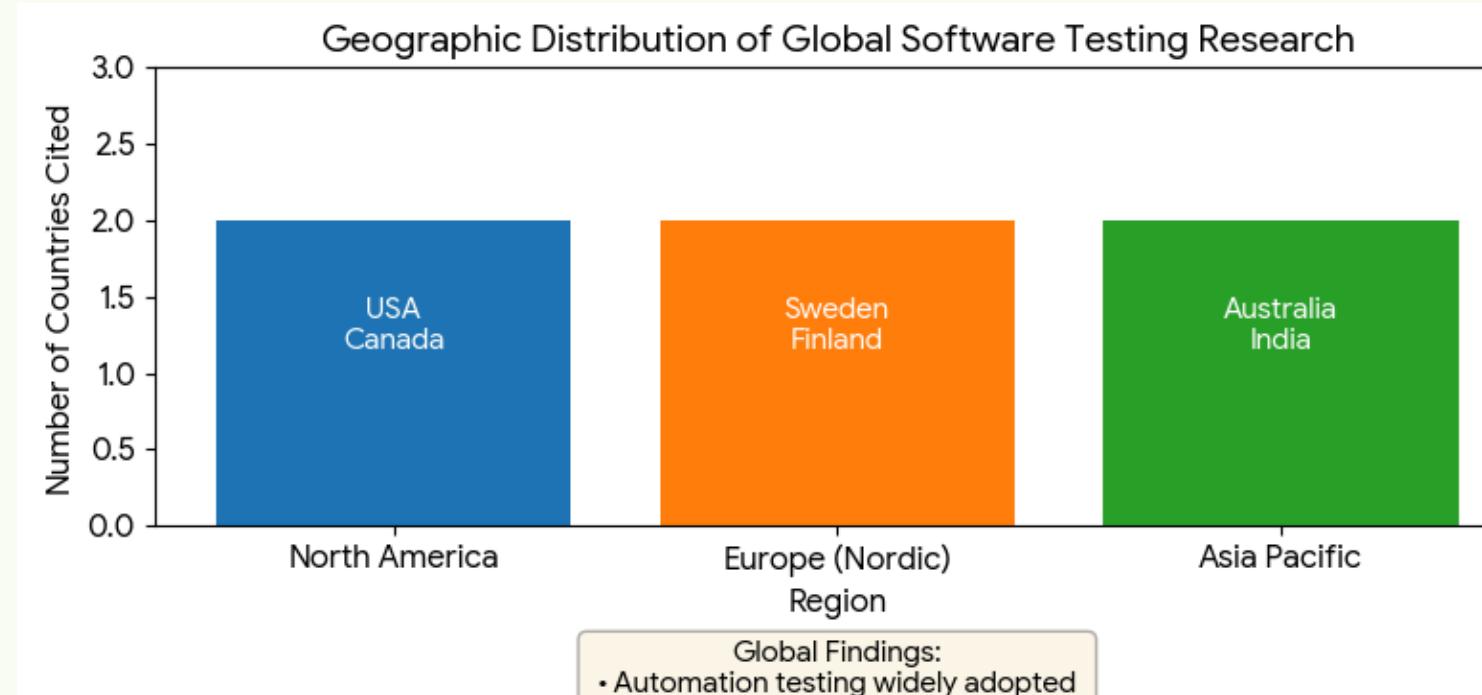




# Objectives

1. Examine testing practices used in Bangladesh software firms
2. Identify commonly used testing tools & techniques
3. Understand major QA challenges
4. Provide insights for improving testing maturity in the industry

# Background



## Global Research

**Studies conducted in:** USA, Australia, Canada, Sweden, Finland, India

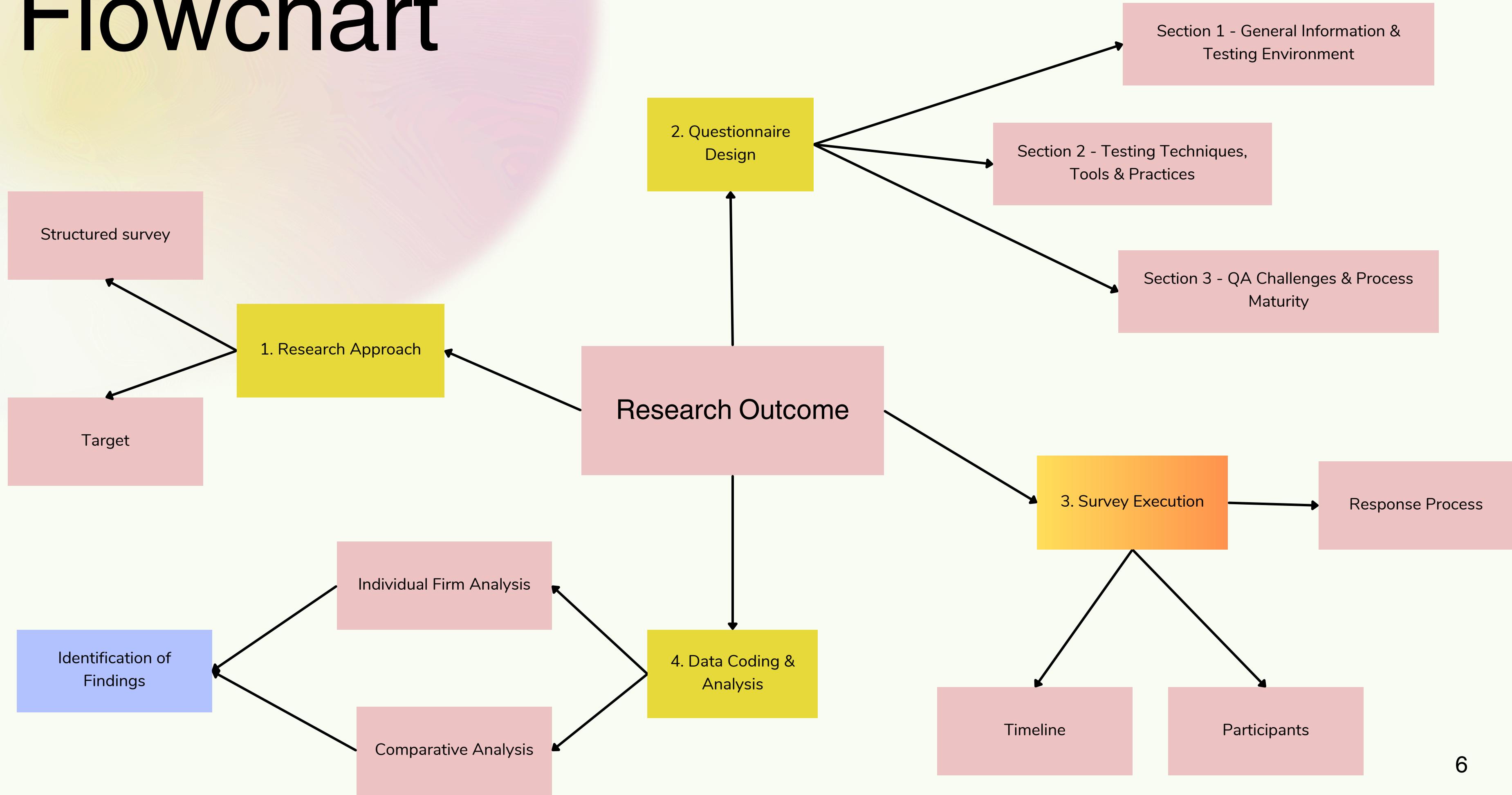
### Global Findings:

- Automation testing widely adopted
- Regression & unit testing highly used
- Developing countries struggle with skilled testers
- Tools support CI/CD & modern QA workflows

## Gap in Bangladesh

- Several studies on SDLC, communication, requirements, etc.
- No major survey on testing tools & techniques in Bangladesh
- Lack of data on QA challenges & testing maturity
- This paper fills that gap through a 10-firm industry survey

# Flowchart



# Survey Design

## Survey Execution & Methodology

- Conducted July–September 2019 across 10 leading software firms in Dhaka.
- Respondents were mainly QA Team Leads/Heads, ensuring reliable and expert-level insights.

## Questionnaire Structure (33 Questions)

- General Profile
- Techniques & Tools
- Maturity & Challenges

## SURVEY PROCESS TIMELINE

JULY–SEP 2019

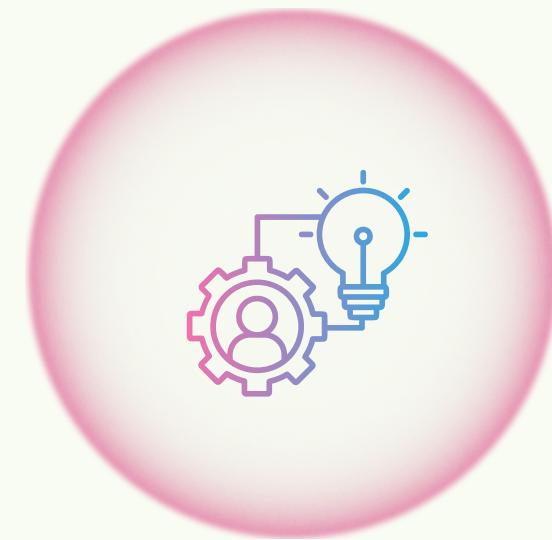


# Questionnaire Structure



## General Profile

Company details, software categories, platforms, and QA team size



## Techniques & Tools

Manual vs. automation usage; correctness security testing; tools like Selenium, JMeter, Jira.



## Maturity & Challenges

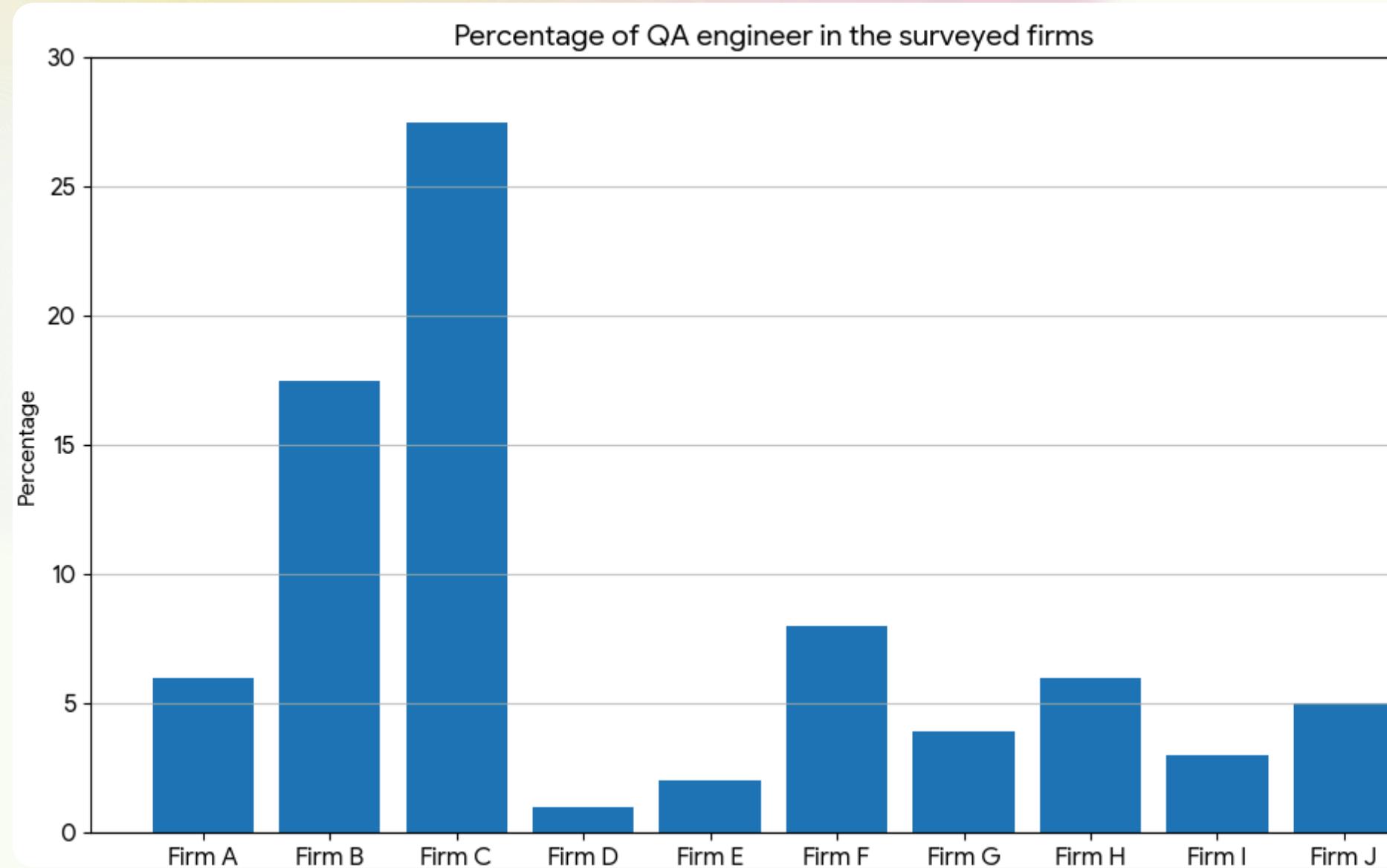
Test automation level, difficulties faced, and compliance with standards

# Participant Overview

## Firm Characteristics

- **Software Types:** Web MIS, ERP, Mobile Apps, Financial Systems, and specialized tech (Face Recognition).
- **Platforms:** Java, .NET, Android, iOS, PHP.
- **QA Staffing:**
  - **Low Ratio:** Most firms have a very low percentage of dedicated QA engineers (e.g., Firm D has 1%, Firm E has 2%).
  - **Exceptions:** Only Firms B and C had significant QA staffing (17.5% and 27.5%).
- **Process:** 70% follow formal testing processes; 20% mix formal/informal.

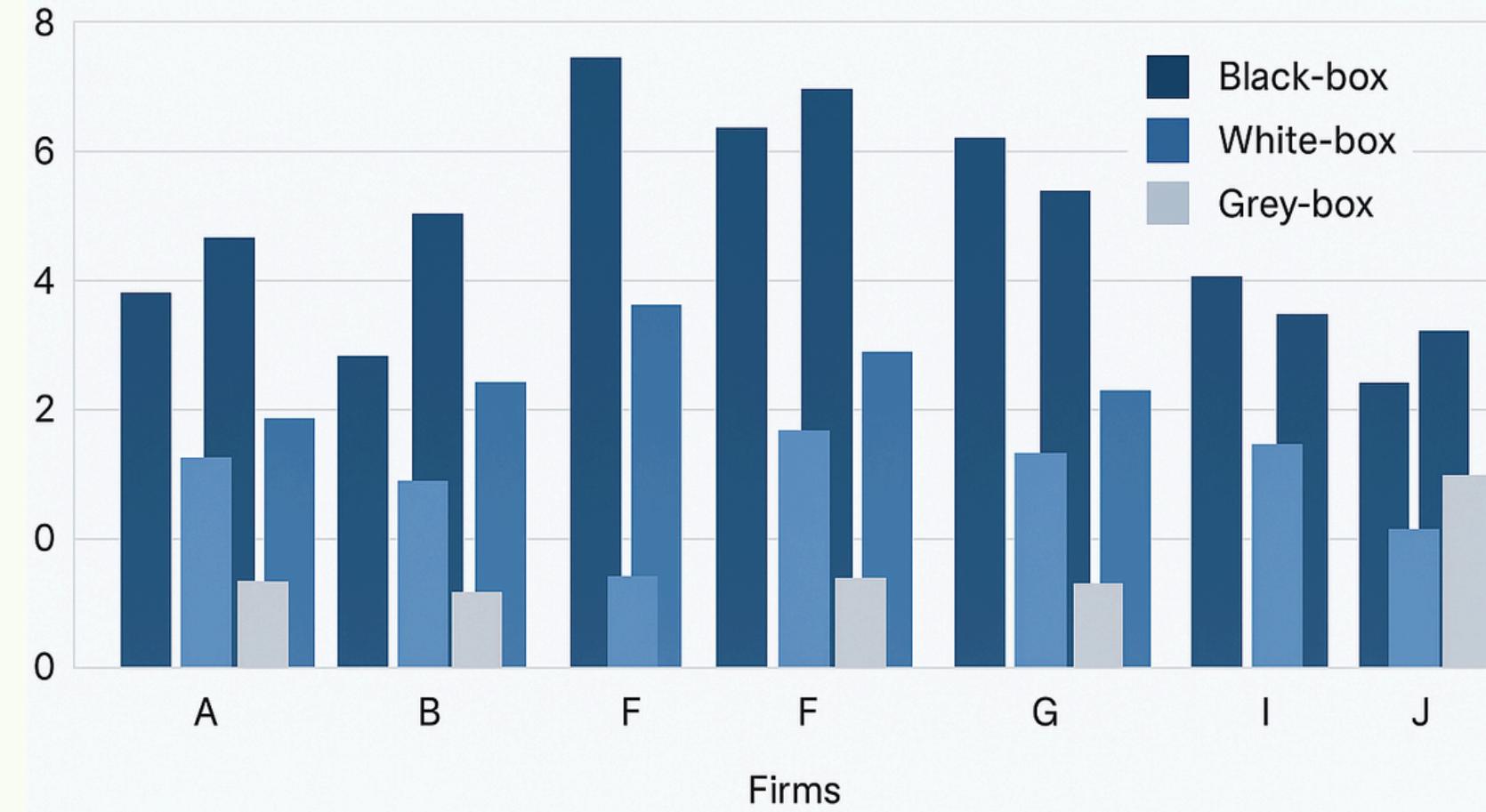
# Key Metrics Collected



**Figure 1 shows:**

Percentage of QA engineers per company (A–J)  
Values ranging from 1% to 27.5%

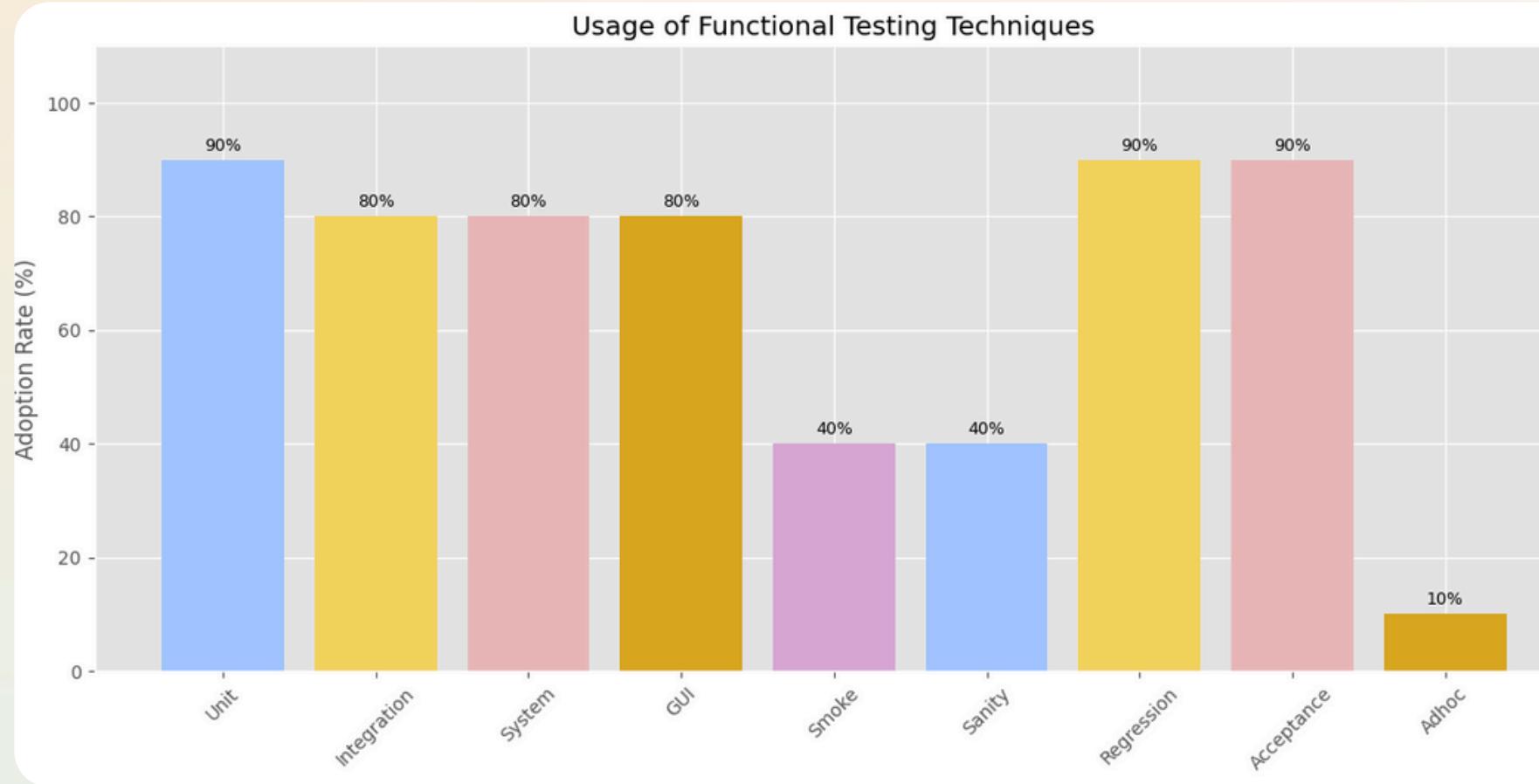
Usage of Correctness Testing Techniques in Software Firms



**Figure 2 shows:**

- Usage of Black-box, White-box, Grey-box
- **Black-box most common**

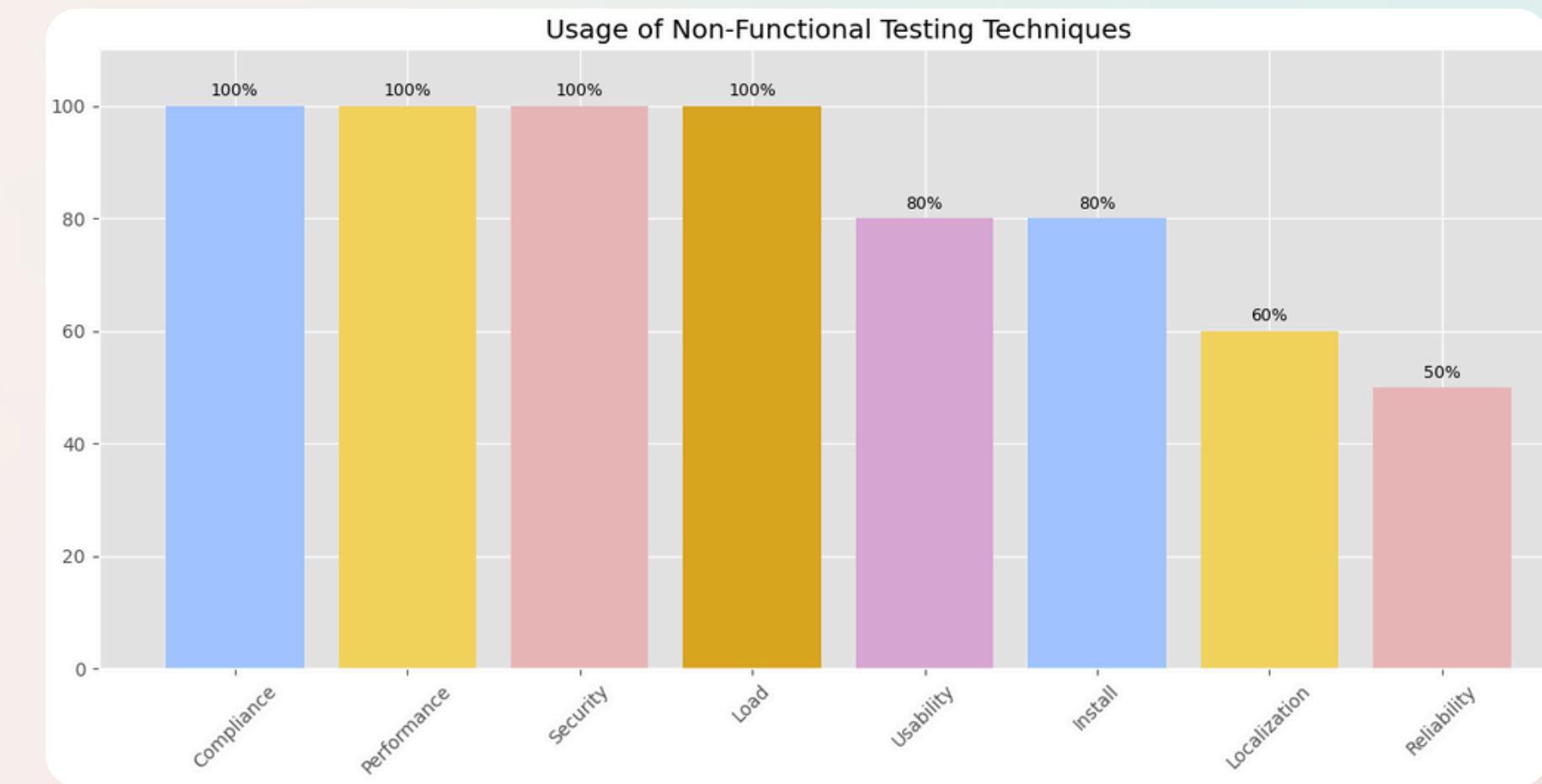
# Functional & Non-Functional Testing Techniques



**Figure 1 shows:**

Most-used functional test types:

- Unit testing
- Integration testing
- System testing
- GUI testing
- Regression testing ( $\approx 90\%$ )
- Acceptance testing ( $\approx 90\%$ )
- Smoke & sanity testing widely used

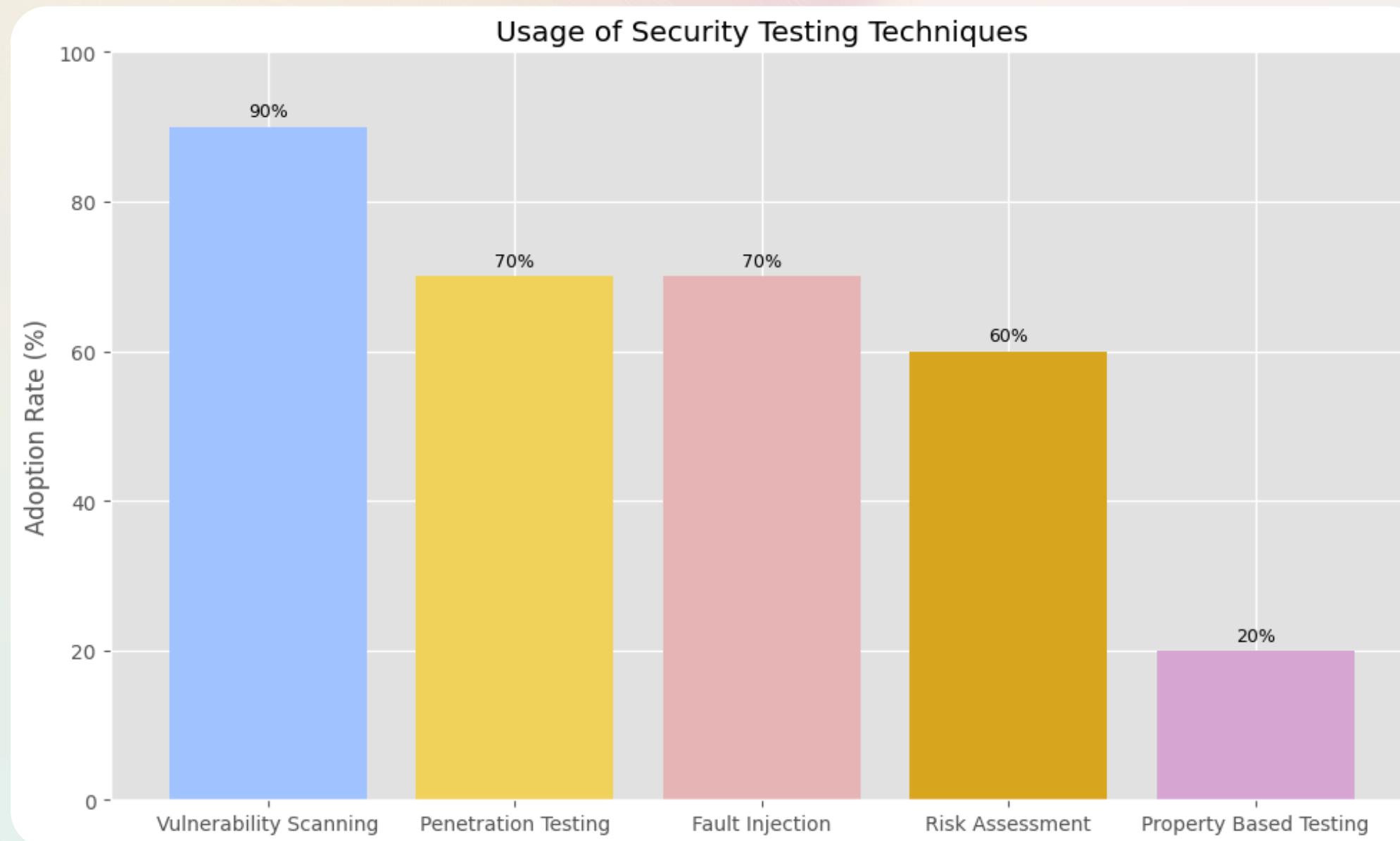


**Figure 2 shows:**

Non-Functional Testing:

- 100%: Performance, Compliance
- 80%: Usability, Install testing
- 60%: Localization

# Security Testing Techniques Usage

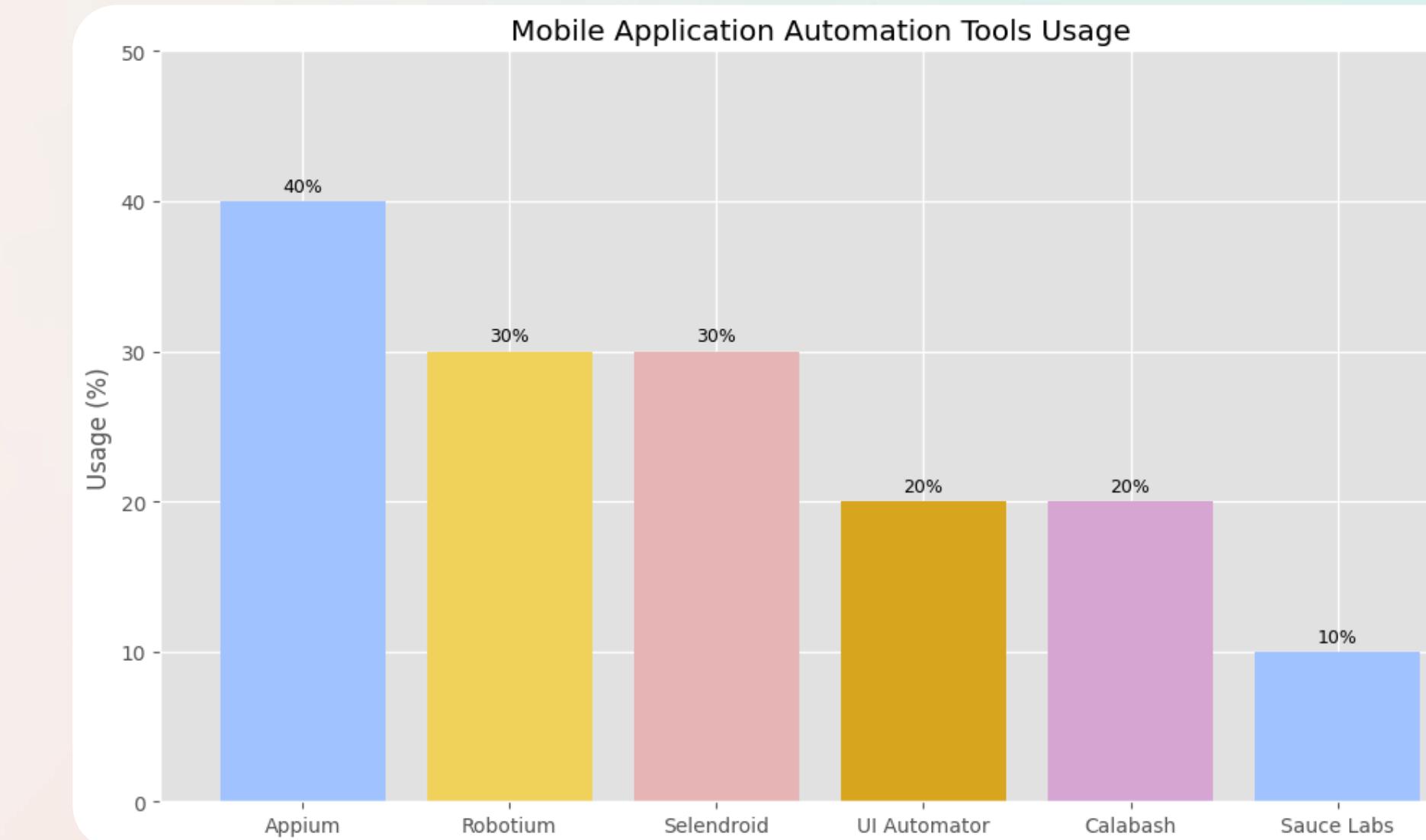
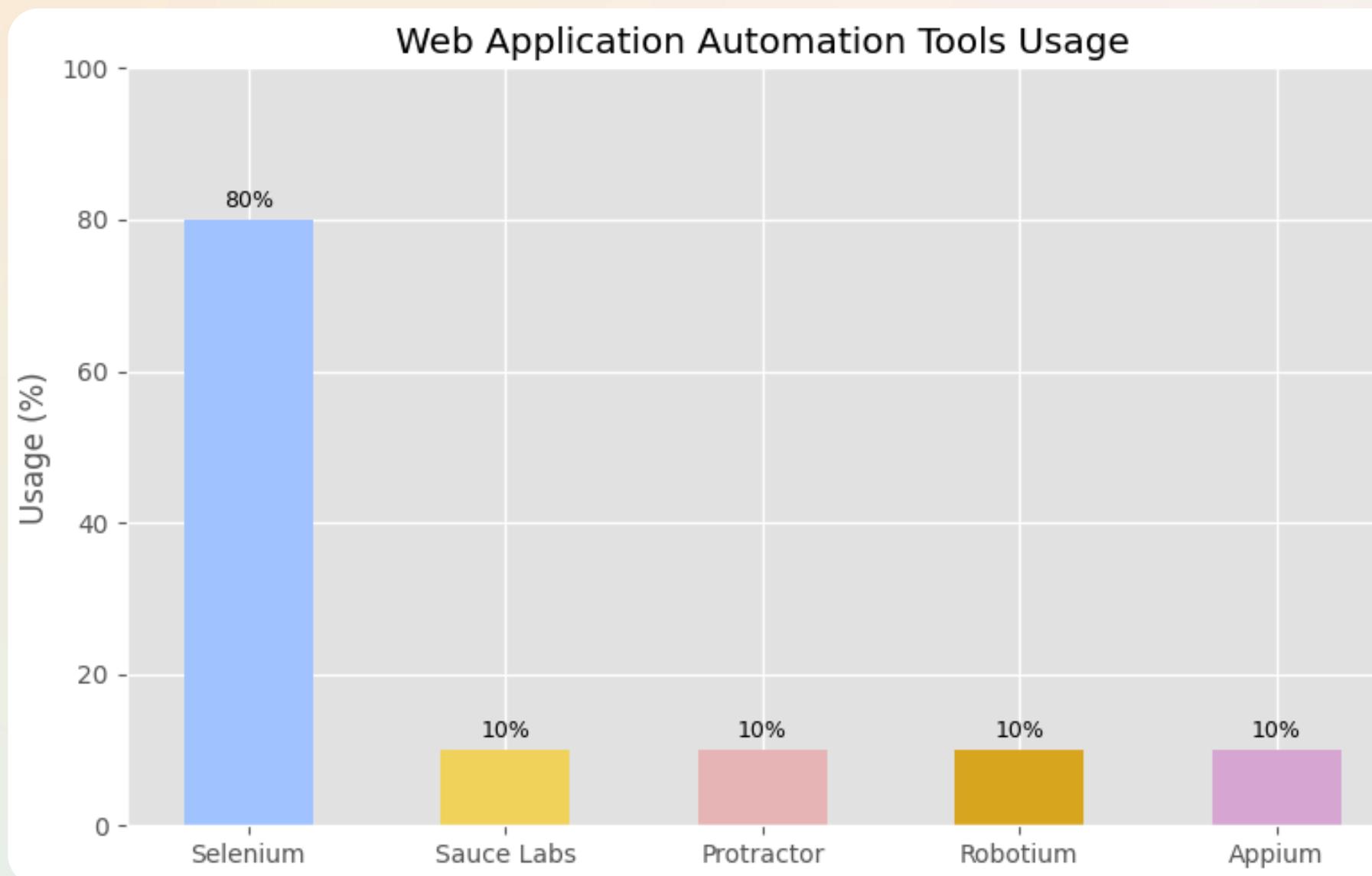


**Figure shows**

**Security Testing:**

- 90%: Vulnerability scanning
- 70%: Penetration testing
- 70%: Fault injection
- 60%: Risk assessment

# Functional Automation Tool Usage



**Figure 1 shows:**  
**Functional (Web):**

- Selenium → 80%

**Figure 2 shows:**  
**Mobile Testing:**

- Appium (40%)
- Robotium (30%)
- Selendroid (30%)
- Many firms still test mobile apps manually

# Automation Tool Usage for Load & Bug

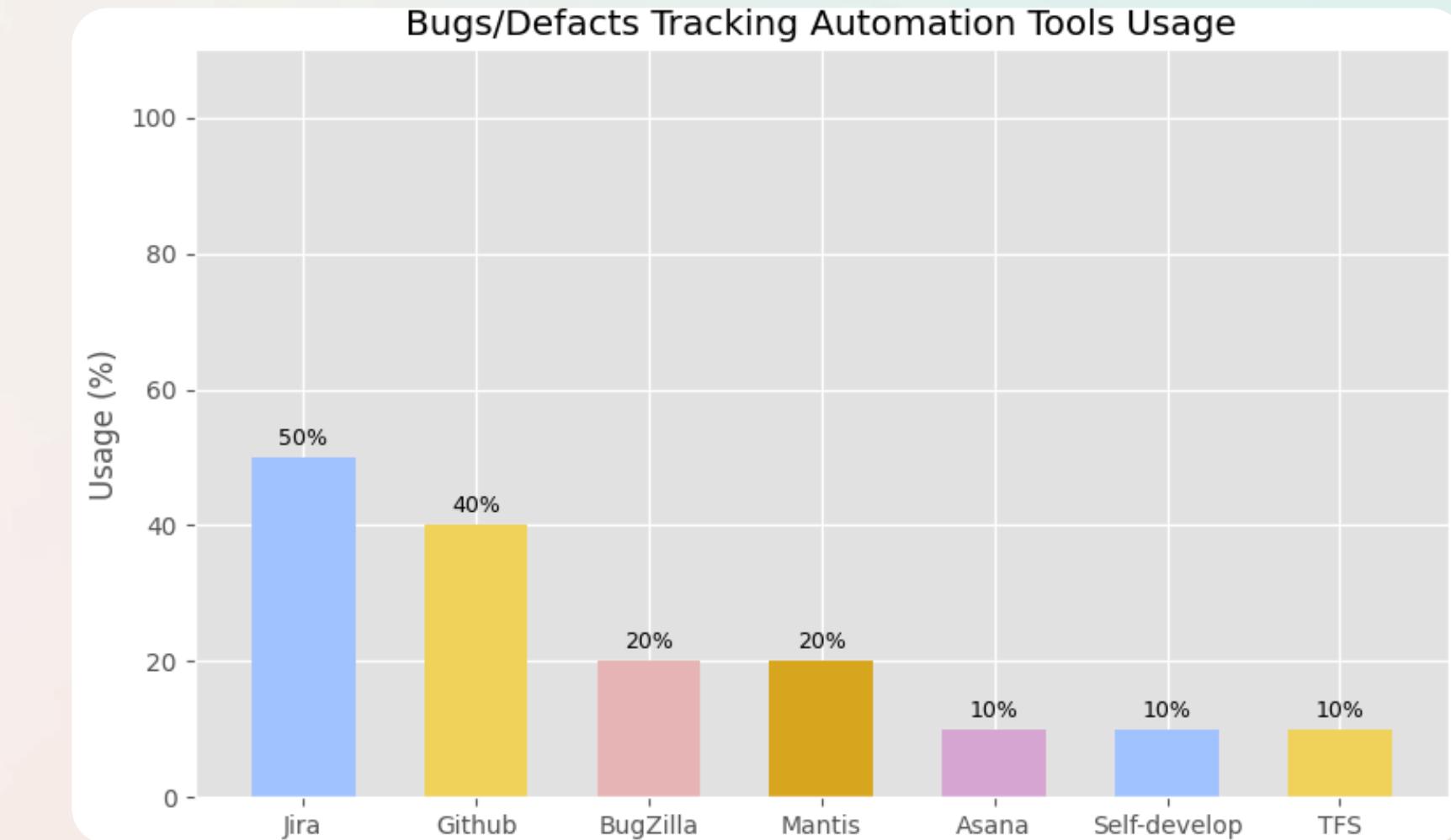
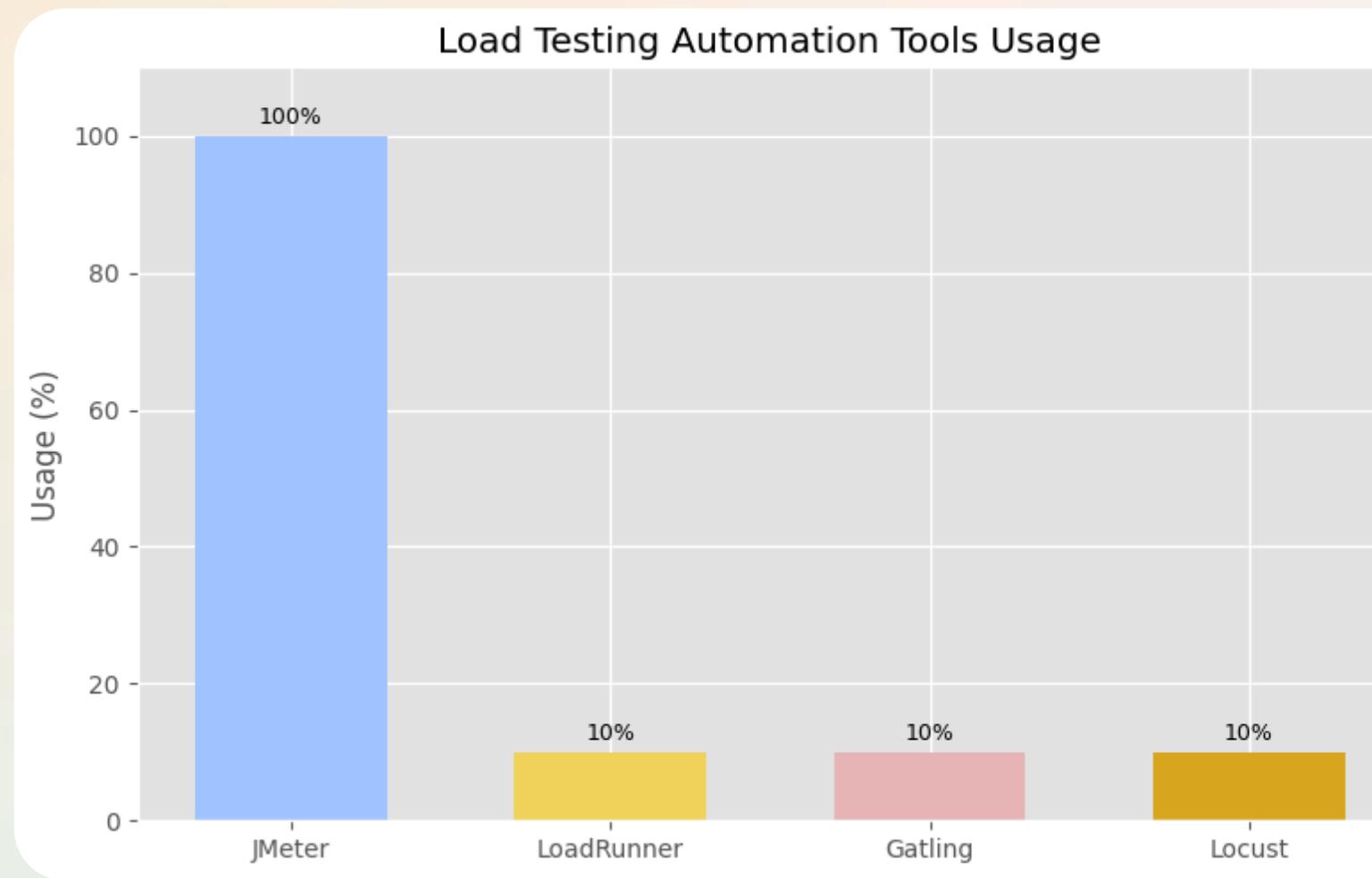


Figure 1 shows:

## Load Testing:

- JMeter → ≈100%
- Other tools: LoadRunner, Gatling, Locust

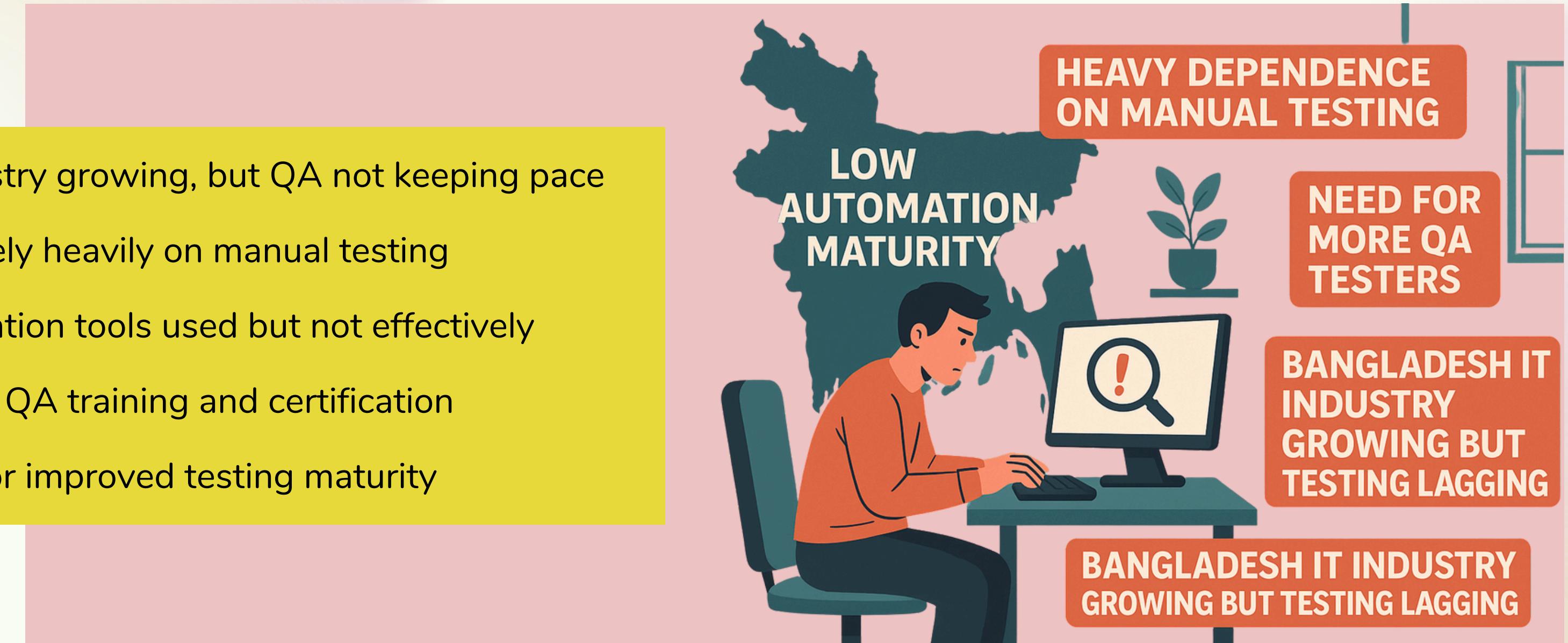
Figure 2 shows:

## Most used tools:

- Jira (50%)
- GitHub Issues (40%)
- Bugzilla (20%)
- Other tools: Mantis, Asana, Redmine, TFS

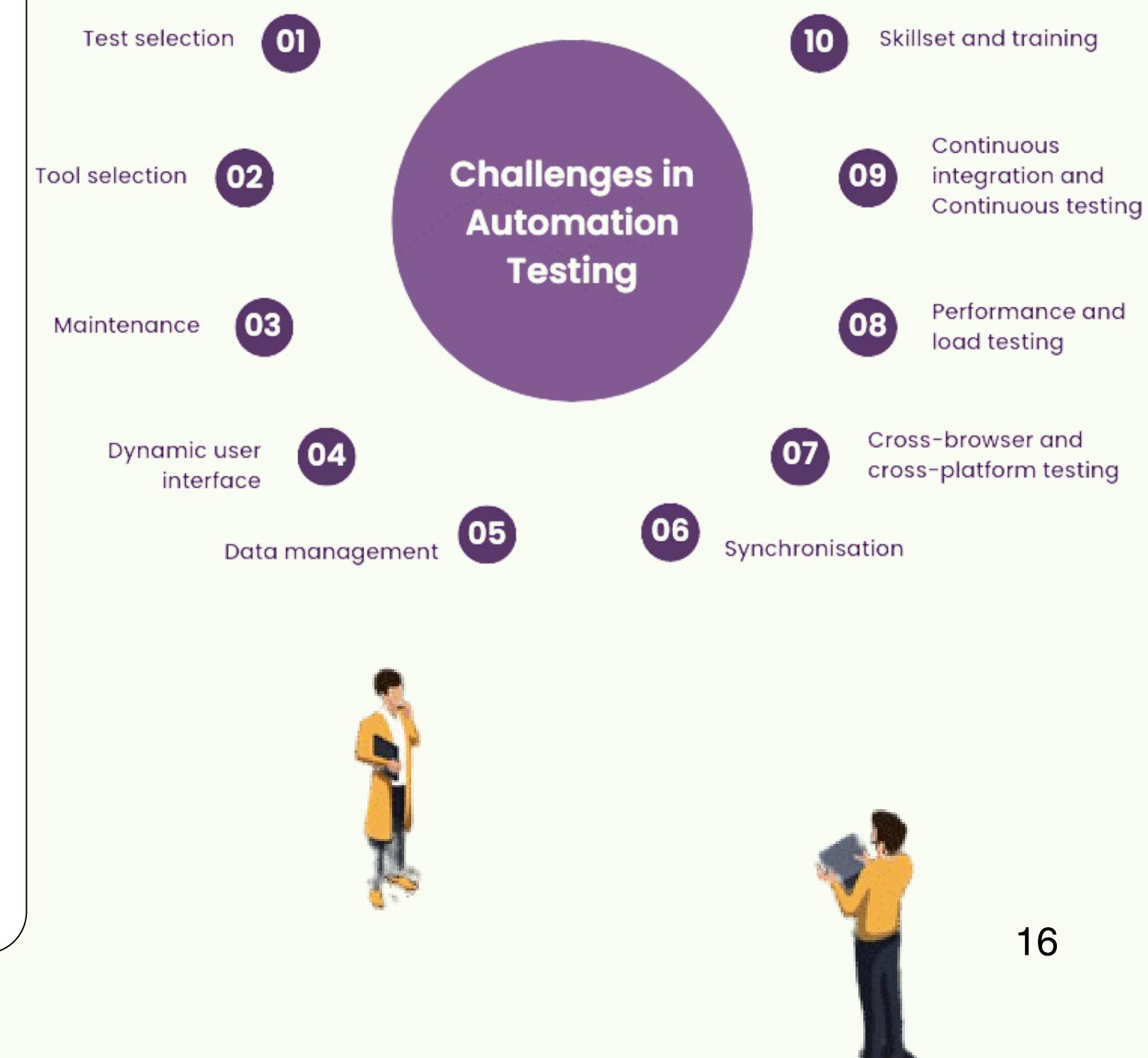
# Conclusion From Survey

- IT industry growing, but QA not keeping pace
- Firms rely heavily on manual testing
- Automation tools used but not effectively
- Limited QA training and certification
- Need for improved testing maturity



# Challenges

- **Shortage of skilled QA engineers; low-quality entry-level testers**
- **Weak practical QA education; limited formal training & few ISTQB-certified testers**
- **Low adoption of automation; lack of automation experts**
- **Limited use of testing tools beyond basic Selenium/JMeter**
- Resource and time constraints affecting **testing depth**
- **Long testing cycles due to manual-heavy processes**
- **Inconsistent standards** (few firms follow CMMI/ISO)
- **Weak testing culture** QA not integrated early; limited CI/CD practices



# Comparison of Bangladesh vs. Global

The study's primary contribution lies in filling a geographical knowledge gap, as previous research focused on developed IT markets.

While Bangladeshi firms successfully perform core functional, non-functional, and security testing, the industry lags significantly in its adoption of automation and standardization, particularly when compared to countries where such practices are now mature.

SQA Indicator	Developed Markets	Bangladesh (Survey Findings)
Core Process	Automation is a clear <b>imperative</b> ; <b>high adoption</b> of TDD/Agile Testing.	<b>90% reliance on manual testing</b> ; automation is an afterthought, applied selectively.
Standardization	High <b>adherence</b> to CMMI/ISO; strong <b>emphasis</b> on test-related training and certification.	<b>40% of leading firms follow no standard</b> ; low emphasis on ISTQB certification.
Staffing & Expertise	<b>Structured hiring</b> and continuous training; focused effort to increase <b>QA-to-Dev</b> ratios.	<b>Severe talent crisis</b> ; scarcity of certified automation engineers; low overall QA staff percentage.
Tool Usage	<b>Integrated use</b> of specialized tools across the lifecycle (e.g., JUnit for Unit Testing).	<b>Tools used in silos</b> : Jmeter for load, Selenium for web. Four firms manually test mobile apps.

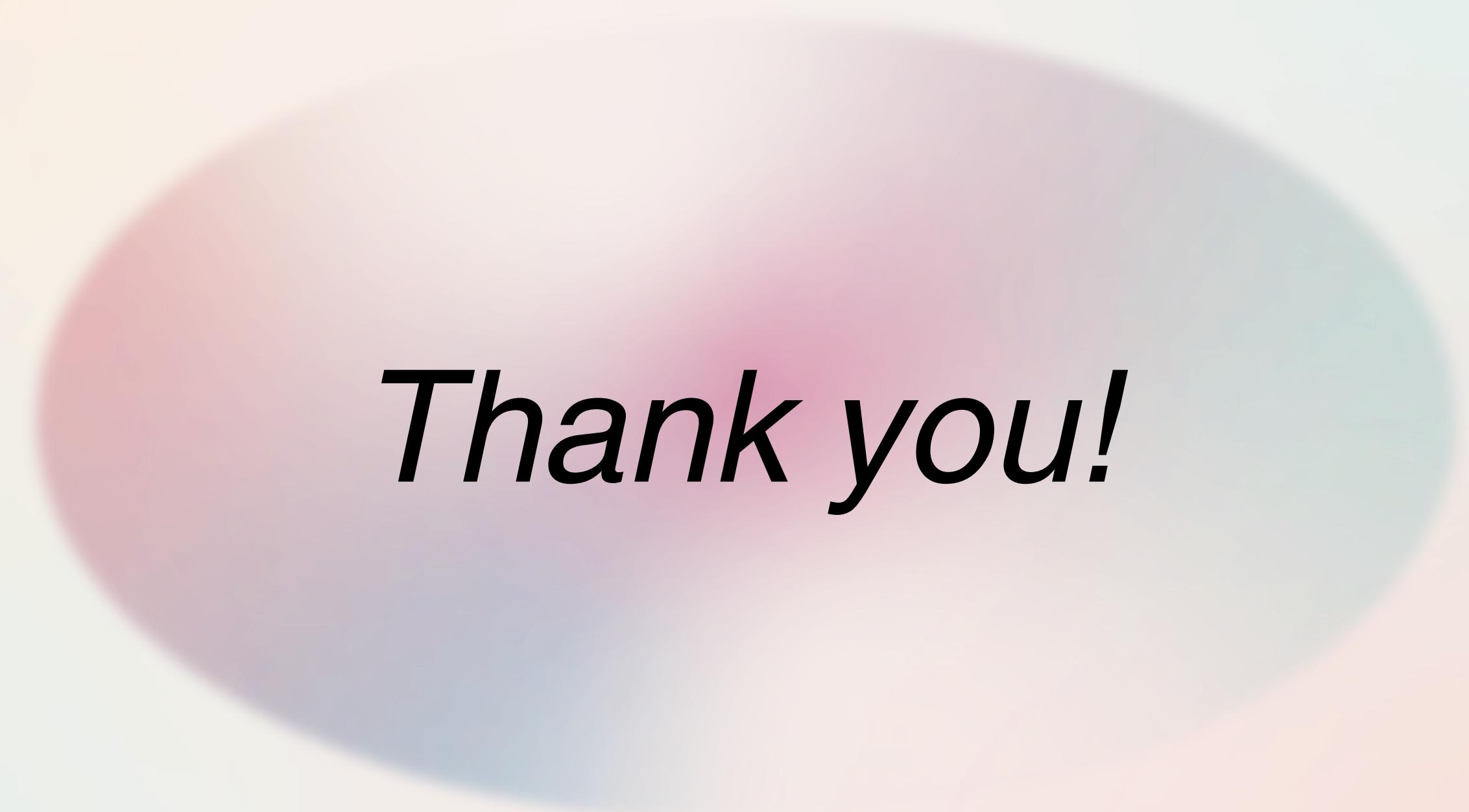
# Recommendation

## For the Software Industry

- **Full Automation:** Move beyond selective automation; fully automate functional & non-functional testing across all platforms.
- **Strengthen QA:** Increase QA-to-developer ratio; integrate QA early in Agile/DevOps cycles.
- **Certification:** Mandate training & certifications (e.g., ISTQB) to close the skills gap.

## For Academia and Policy

- **Curriculum Update:** Introduce hands-on courses in testing, requirements engineering, and automation tools.
- **Industry Collaboration:** Formal internships and knowledge-sharing to build practical skills.
- **Standard Adoption:** Promote/subsidize CMMI and ISO standards to institutionalize process maturity.



*Thank you!*