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WHITEPAPER

Building, Breaking & Beyond

The SDET Approach to Software Excellence

The Rising Criticality of SDET In a Dynamic Landscape

Organizations are operating in an increasingly dynamic tech landscape, shaped by emerging technologies, system complexity, and the need for flexibility and agility. This has led to the evolution of roles that expand beyond their traditional origins to scale up productivity and quality while delivering value to customers.

SDET (Software Development Engineer in Test) is an IT specialist with the ability to function equally well in both development and testing roles. The role of SDET has become critical in the present fast-paced landscape due to the need for a role with multiple skills (design, development, and testing). The use of agile techniques and the increasing need to provide higher-quality products at a faster rate have increased the importance of SDET in an enterprise.

Key Roles & Responsibilities of SDET

As the role evolves, the SDET's duties and responsibilities have come to include:

1

Customer Perspective

The SDET helps to translate business requirements into technical solutions. To make sure the product satisfies the needs of the consumer, the SDET should be able to comprehend their viewpoint. They ought to be able to determine the demands of the client and offer solutions in line with those needs. They also play a crucial role in investigating customer issues referred to by the technical support team.

2

Flexibility to work in Agile Environments

The SDET ought to be capable of working in a flexible setting and accountable for the product's quality. They play a vital role in participating in all phases of product design and collaborating with the product manager, project development team, and other stakeholders. They must be ready to collaborate with developers and various stakeholders to ensure the product is supplied on schedule and satisfies the requirements.

3

Development

The SDET plays a role in envisioning, crafting, and architecting computer programs with their extensive technical skills. They not only ideate and innovate by developing new software but also contribute to the enhancement and maintenance of existing applications. Beyond coding, they diligently scrutinize code for errors and bugs, actively managing bug reports and fostering seamless communication within their teams. Collaboration is key as they work closely with fellow developers, managers, UX designers, and other stakeholders. Moreover, they oversee the organization and upkeep of code repositories and project files, employing version control systems like Git to maintain order, facilitate collaboration, and ensure accessibility across the team's workflow. As per requirement, they also partake in discussions on architectural design and provide insightful feedback.

4

Manual Testing and Test Automation

In product or digital engineering, the SDET should be able to set up test automation frameworks for functional and non-functional testing including security and performance testing. They should be able to monitor bug reports, collaborate with the team, quickly fix and verify using test automation, and then deploy using DevOps pipelines.

The SDET must be capable of creating various acceptance tests and test scenarios. In order to comprehend the systems or APIs of their clients, they must manage technical communication with partners. Additionally, SDET collaborates with deployment teams to address any system-level problems. They need to be competent in the setup, upkeep, and management of test automation frameworks.

5

DevOps Responsibilities

SDET must be capable of carrying out tasks including code reviews, Continuous Integration (CI), and Continuous Deployment (CD) pipelines. They also help with creating reusable scripts/tools wherever required.

How does SDET add value to the enterprise?

01

Holistic Perspective

With a strong programming language and testing background, an SDET can develop, manage, deploy, and run applications. SDET helps to bring in the holistic and expert perspective of a developer, tester and a quality analyst.

02

Enhanced Quality and Compliance

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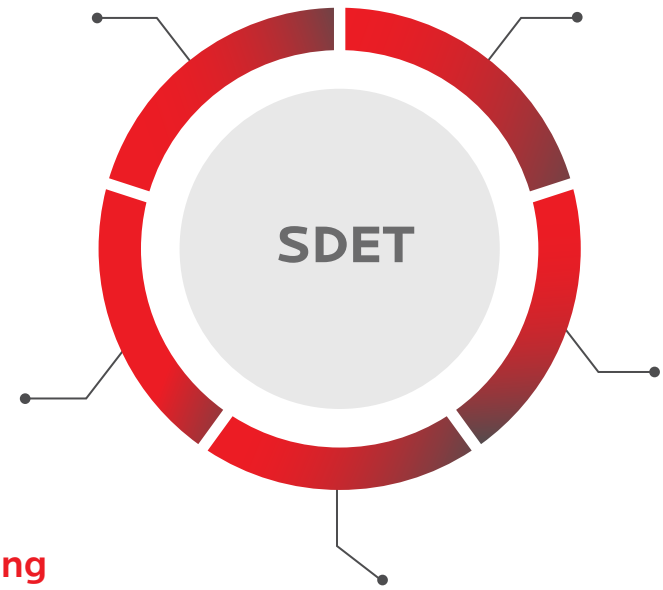


03

Automation

SDET helps to automate most manual tasks leading to reduced repetitive effort.

04

Championing the customer's cause

SDET understands customer expectations and requirements thoroughly and can deal with customers directly.

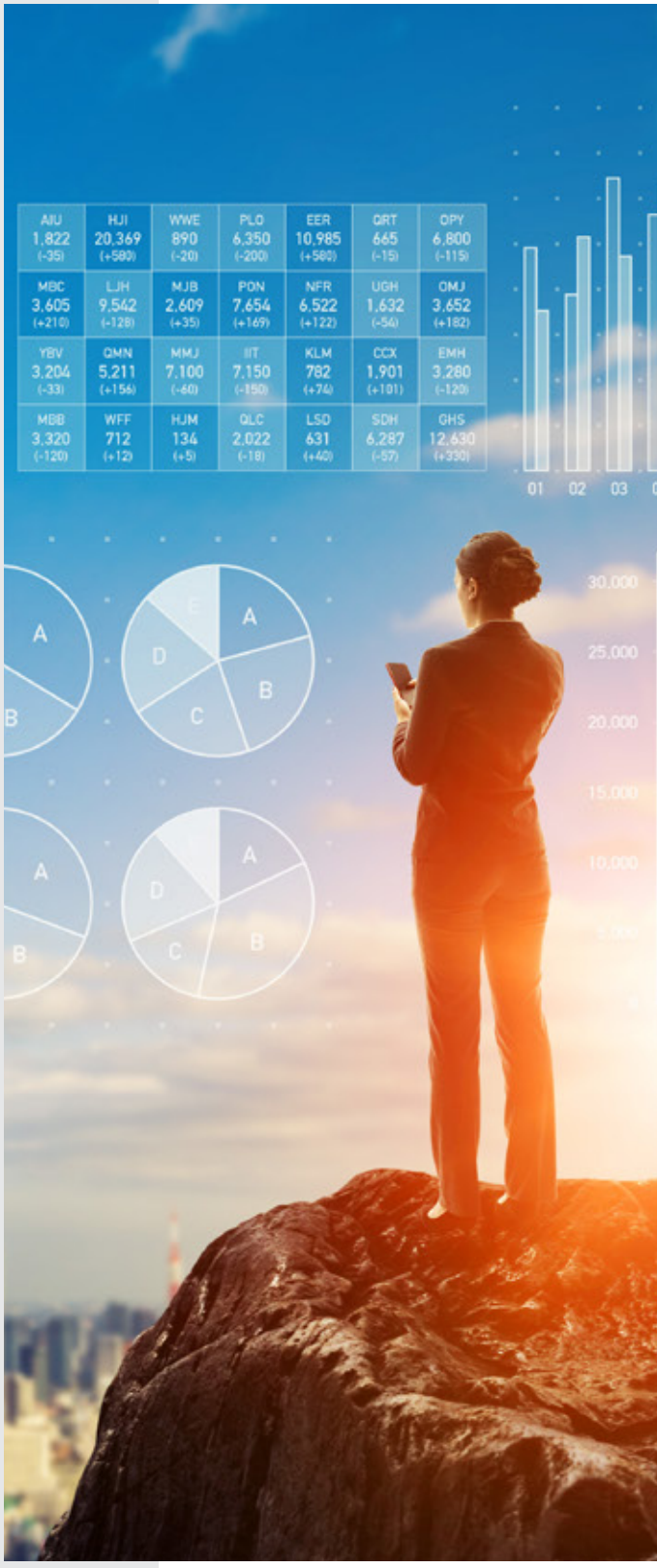
05

Evolution from traditional testing

Traditional testing consumes considerable time and resources. In this scenario, SDET performs unit tests and source code reviews, speeds up the process and reduces expenditure and go-to-market timelines.

Embarking on SDET Mastery

Many professionals in the testing and development field often begin with manual testing to understand the application, and its functionality, and to gain insights into potential areas for automation. Transitioning from manual testing to automated testing is the next step. Both Python and Java are popular programming languages for automation testing, and they are widely used in the SDET role. These languages offer a range of libraries and frameworks that make them suitable for writing automated test scripts.



Automated testing offers several benefits. Re-usability, consistency, parallel execution, and increased test coverage are well-established advantages of automation testing. Automated tests can be reused across different builds and releases, ensuring consistency in test execution. Parallel execution allows multiple tests to run simultaneously, saving time. Additionally, automation can increase test coverage by efficiently executing a large number of test cases in a shorter time frame.

Hence, mastery of SDET can help enterprises accelerate the delivery of high-quality software and enable continuous improvement of the development and testing processes.

SDET Innovation: A Roadmap for Enterprises – Steps and Best Practices

- **Test Scenario Planning and Documentation:**
  Understand software requirements, identify test scenarios, create test steps, and document expected results for comprehensive test coverage.

- **Re-usability and Traceability of Test Cases:**
  Ensure test cases are reusable, maintainable, and traceable, promoting efficiency and clarity in testing processes.

- **Strategic Automation Decision-Making:**
  Evaluate each scenario to determine if automation brings genuine benefits, emphasizing thoughtful decision-making for optimal testing outcomes.

- **Collaboration Across Teams:**
  Foster collaboration with various teams, including developers, testers, project managers, and business analysts, emphasizing empathy and considering multiple viewpoints.

- **Success Criteria and Requirement Alignment:**
  Define success in testing based on meeting all requirements, ensuring that the software aligns with specified criteria for success.

- **Continuous Learning and Tool Proficiency:**
  Stay updated on programming languages and test tools, enabling informed choices in diverse testing contexts.

- **Defect Identification and Reporting:**
  Understand different defect types and report them effectively, contributing to the improvement of software quality.

- **Clean Coding and Design Patterns:**
  Emphasize clean coding practices and design patterns for maintenance, re-usability, and extendibility of automated tests.

Balancing Developer and Tester Mindsets:
Navigate the hybrid role by balancing both developer and tester mindsets, ensuring effective contributions to both aspects of the software development process.

System Understanding for Reliable Automation:
Understand the tech stack of the system under test to utilize reliable layers in automation, identifying seams within the application for targeted testing.

Key Performance Indicators (KPIs) in Testing:
While organization-specific, focus can be on standard KPIs such as Defect Density, Test Coverage, Pass/Fail Rates, Defect Reopen Gate, Mean Time to Detect, Mean Time to Repair, and Customer Reported Defects for effective quality assurance.

SDET Symphony: Crafting the Perfect Partner

Industry and Domain Expertise:
Enterprises should seek experienced partners with a proven track record in Test Automation within the relevant industry and domain.

Technology Stack Proficiency:
A decisive factor is the partner's proficiency in the Technology Stack, encompassing knowledge of programming languages, testing tools, and frameworks commonly used in the IT environment.

Integration into CI/CD Pipelines:
An ideal SDET (Software Development Engineer in Test) partner should possess the capability to seamlessly integrate testing into CI/CD pipelines. This involves automating tests at various stages of the development pipeline to provide rapid feedback.

Agile Methodologies Proficiency:
Proficiency in Agile methodologies is crucial for aligning testing activities with the iterative and collaborative nature of Agile development.

Resource Scalability:
The organization must be enabled by the IT partner to scale up resources dynamically according to project needs or as per the estimated resource plan.

Compliance Awareness:
Consideration should be given to the compliance awareness of the vendor in both the country and industry of operation of the enterprise.

Client Referrals:
Client referrals serve as a reinforcing factor in solidifying the selection of the partner.

Tools & Framework Proficiency:
Evaluate partners based on their competence in testing tools and frameworks, including any homegrown accelerators. Partner's capability in leveraging these accelerators and custom solutions indicates a higher level of innovation and adaptability.

They way ahead for SDET

As the technological landscape evolves rapidly, the SDET role will be critical in dealing with emerging technologies and complexity. The ability to bring together coding and testing abilities stands SDET in good stead to enhance quality, security, and software delivery and aid innovation and collaboration in the enterprise. Hence, organizations that adopt SDET are well-poised to deliver growth while staying adaptable and relevant in a dynamic landscape.

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