



Codeless Testing Automation



BUSINESS-DRIVEN TEST AUTOMATION (BDTA)

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INTRODUCTION

The digital world is constantly innovating to cater to changing user needs, since superior user experience is the name of the digital game. In the business world, although profit is the name of the game; superior user experience is a significant profit influencer, since digitization has touched every business worth its salt. It's true that a company can reach millions through its app, but it's equally true that every app has to jostle with millions of other apps, even unrelated ones, to grab limited user attention.

Business-Driven Test Automation (BDTA) has been born out of this need for excelling in the dual games of superior user experience and robust bottom lines. It is basically a philosophy to drive business value into test automation practices, as apps are the direct link of a business to its present and future customers, who in turn, determine the bottom line. Business-Driven Test Automation places the spotlight on business goals in the testing process; thus going beyond the realm of merely verifying the functional and performance aspects of the software. While BDTA is not a testing technique or methodology, its significance stems from the fact, that it focuses on business goals to ensure a superior offering, in a bid to enhance superior user experience.

A software testing approach that puts the emphasis on meeting business needs, will definitely interest business owners, because then testers are speaking their language! Thus, BDTA is a synergic approach that brings fusion between the testing and business worlds by involving Business Analysts along-with the QA team, right from the start of the Software Development Life Cycle (SDLC).

The pages that follow will unravel this important subject, by addressing the 'What', 'Why', and 'How' of Business-Driven Test Automation.



ABSTRACT

User experience can make or break a business, as apps have come to rule the roost in deciding what drives customer loyalty and how businesses operate. An app which is slow, hangs often, crashes, or puts customers' data at risk will definitely dent the company's image, leading to the migration of customers to competitor sites, which in turn dents the company's bottom line. It is against this background that Business-Driven Test Automation (BDTA) is finding many takers.

This Whitepaper explores this valuable testing philosophy, dividing it into three sections:

- **The 'What' of Business-Driven Test Automation**
- **The 'Why' of Business-Driven Test Automation**
- **The 'How' of Business-Driven Test Automation**

The first section titled 'The 'What' of BDTA', is an overview of what BDTA is all about, placing it in the larger context of Business-Driven Software Solutions; and also comparing it with Traditional Test Automation for a clearer understanding.

The second section titled 'The 'Why' of BDTA', reveals its importance, highlighting its multifarious benefits for all stakeholders.

The third section titled 'The 'How' of BDTA', presents a step-by-step guide for smooth adoption of BDTA. For a more practical study, it also presents a simple example of how business goals can be incorporated into test automation, to make testing a useful partner in meeting business goals.

Read on to discover more about the interesting BDTA philosophy.



THE 'WHAT' OF BUSINESS-DRIVEN TEST AUTOMATION

This first section presents a basic understanding of Business-Driven Test Automation (BDTA), holistically reviewing its role vis-à-vis the wider philosophy of Business-Driven Software Solutions. It also presents how the BDTA approach moves beyond Traditional Test Automation.



01

BDTA – A Subset of Business-Driven Software Solutions

Apps have come to be the face of organizations, as they are the vital link to customers (present and potential) and thus become the conduits for achieving organizational goals. Realization has therefore increasingly dawned, that apps can be great brand ambassadors for organizations, and help promote business goals. This resulted in a shift in the goalpost for IT solution providers, who then started adopting a business-driven approach to software development and testing.

In this approach, software solutions expand their horizon to include business goals, thus going beyond the traditional Functional and Non-functional software requirements. While Functional requirements concentrate on what the software must do; Non-functional requirements determine how effectively it should be done, putting emphasis on specifications like speed, security, reliability, and usability. Business-Driven Software Solutions go further, to put business goals at the forefront and build the software around it. Thus, the app become not just a means of customers effortlessly connecting with the organization, but it also promotes business goals in addition to fulfilling its traditional Functional and Non-functional roles.

Presenting an example of a Business-Driven Software Solution to make the concept clearer.

BUSINESS GOAL: To boost Customer Satisfaction and Operating Efficiency

SOFTWARE SOLUTION: Implementing an Integrated Customer Relationship Management (CRM) System

FOCAL POINTS:

- **Centralizing Customer Data**
The CRM system collects and centralizes customer data from various sources – online purchases, in-store transactions, social media interactions, etc.
- **Personalizing Marketing**
The collated data, provides the base for the CRM system to formulate personalized marketing campaigns, like sending targeted promotions based on customers' purchase history and preferences.
- **Integrating Inventory Management**
The CRM system integrates with the inventory management system, to provide real-time updates on product availability, consequently preventing overselling or stockouts.
- **Automating Customer Care**
Implementing chatbots and automated customer care processes within the CRM system to reduce response time, handle routine queries, and free up human resources for more complex issues.
- **Data Analytics and Reporting**
The CRM system presents robust analytics and reporting tools to identify trends, track customer behavior, and measure the effectiveness of marketing campaigns – laying the firm foundation for data-driven business decisions.

02

Business Impact

- **Enhanced Customer Satisfaction**
Personalized interactions and timely responses boost customer satisfaction, nurturing loyalty and repeat business.
- **Operational Efficiency**
Automation of routine tasks and integration of systems, paves the way for reducing manual errors, streamlining processes, and enhancing overall operational efficiency.
- **Increased Revenue**
Data analytics-based targeted marketing campaigns, facilitate increased conversion rates and boosts sales.

- **Cost Savings**

Automation and efficiency improvements contribute to cost savings in customer care and inventory management.

In the business-driven approach, the SDLC incorporates Business-Driven Development (BDD) and Business-Driven Test Automation (BDTA). BDD focuses on developing IT solutions that directly satisfy business needs, by adopting a model-driven approach. This begins with the business strategy, requisites and goals, and then refines and transforms them into an IT solution. BDTA incorporates this philosophy into the testing arena, making a concerted attempt to synthesize business goals into the test automation process. Its focal point is to ensure that business goals and testing go hand-in-hand, by executing and evaluating QA practices against business objectives.

Thus, in BDTA, business objectives become the starting point as well as the measurement for evaluating testing efficiency. Business Analysts and testers become important players who get involved from the beginning of the project, along with developers, to define business rules/regulations, and test scenarios; and generate automated scripts which are then run in the app. The testing process becomes flexible as test scripts can be easily adapted to the changing business needs.



DIFFERENTIATING BUSINESS-DRIVEN TEST AUTOMATION FROM TRADITIONAL TEST AUTOMATION

Particulars	Business-Driven Test Automation	Business-Driven Test Automation
Goals	Business goals and rules are at the forefront, apart from traditional testing requirements.	Aims at fulfilling testing requirements like quality, productivity, speed etc.
Tester's & Business Analyst's Roles	Testers and Business Analysts get involved right from the start of the project. The app under test need not be ready to begin BDTA.	Tester's role begins during the test planning and design phase.
Emphasis	Emphasis is on collaboration between business stakeholders and testing teams, for aligning testing activities with the goals and priorities of the business.	Emphasis is on automation tools and their capabilities.
Technical Expertise	Business Analysts play an important role along-with developers and testers. Test scenarios can be written in normal English and the system converts it into the programming language, hence programming proficiency is not required.	High level of technical expertise needed. Testers need to be proficient in programming languages, and have a deep understanding of the automation tool being used.
Test Script Maintenance	Not difficult as tests are written in a language that is closer to the business domain, which facilitates quick revisions.	Difficult specially when there are changes in the app's UI or functionality. Scripts may need frequent updates to adapt to software changes.
Level of Collaboration	Business stakeholders actively participate in defining test scenarios, test cases, and acceptance criteria, which helps incorporate actual business requirements right from the start.	Testers collaborate with the development team to understand the requirements and accordingly design test cases – identifying test scenarios, creating test scripts, and setting up the testing environment.

With this holistic view of BDTA, this Whitepaper moves on to explain the 'Why' of BDTA.

THE 'WHY' OF BUSINESS-DRIVEN TEST AUTOMATION

BDTA is a strategic approach that aligns testing efforts with overall business goals and objectives, as every app is meant to promote the business it is made for. Hence this section of the Whitepaper will explore 'Why' BDTA is the preferred testing approach, revealing the multifarious ways in which it benefits business owners, testers, and other stakeholders.

Benefits of BDTA -

SPEEDS UP TIME-TO-MARKET: BDTA concentrates efforts on testing the most critical and high-priority features. The testing set-up under BDTA promotes faster identification and resolution of errors, enabling quicker releases, to clinch the all-important time-to-market race.

ENHANCES TEST COVERAGE BDTA channelizes test automation efforts into verifying that the software meets business goals, thus ensuring that all vital aspects of the app are thoroughly tested. This promotes comprehensive test coverage, and decreases chances of critical issues escaping.

COST EFFICIENCY

BD automated tests prove cost effective on many counts, three of which are listed below:

- These tests can be executed repeatedly without incurring additional costs, making regression testing more efficient. This helps early detection and fixing of errors, thus reducing the overall cost of software development and testing.
- BDTA is largely based on continuous business scenarios and processes; hence changes are infrequent, thus reducing overheads of maintaining and changing scripts – quite unlike Traditional Automated Testing, where test maintenance costs are high.
- As Business Analysts guide the testing process in the right direction right from the start, it eliminates the need for highly paid test automation experts, thus reducing costs.

ENHANCES COLLABORATION

BDTA is totally conducive for collaboration between Business Analysts, developers, and testers, and advocates better communication. Since test scripts are often written in a language that is easily understood by non-technical stakeholders, it ensures better understanding of testing outcomes by all.

EASIER TEST MAINTENANCE

Since test scripts under BDTA focus on business needs, they tend to be stable and don't change frequently, and therefore require less maintenance. This saves on time, efforts and resources needed for updating and maintaining automated test suites.

RISK MITIGATION Business-Driven Test Automation puts the spotlight on testing critical functionalities, thus channelizing test automation efforts into identifying and addressing potential risks early in the development process. By pre-empting errors, BDTA averts the risk of major issues escaping into the production phase of the SDLC.

IMPROVES RETURN ON INVESTMENT (ROI) Since business goals are at the heart of Business-Driven Test Automation, it directs investment of resources into areas that bring the most value to the business, which in turn positively impacts ROI, since testing efforts directly contribute to business success.

SCALABLE AND FLEXIBLE

BDTA is a flexible approach to automated testing, designed to be adaptable for changes in business needs and architecture. This flexible approach/design promotes agility and scalability. New features may need to be added as the business grows, and the fact that BDTA can easily adapt to changes, enhances scalability, which is vital for maintaining an efficient and effective testing process in dynamic business environments.

CUSTOMER SATISFACTION

The BDTA approach emphasizes thorough testing of the most critical business processes and functionalities – enhancing app quality, and promoting superior user experience. A user-friendly, effortless app experience definitely enhances customer satisfaction.

REDUCES DEPENDENCY ON TEST AUTOMATION EXPERTS

BDTA reduces the need for expensive programming experts due to the following reasons:

- Test scenarios can be written in normal English eliminating need for expensive programming experts, as the codeless automation tool converts it into coded scripts.
- Business Analysts rather than costly test engineers, steer the testing process.
- Business-oriented expertise of Business Analysts makes it much easier to make changes in business rules and scripts without depending on technical test experts.

ELIMINATES REDUNDANCIES OF FRAMEWORK DESIGN

Business Analysts with business expertise, provide the guidelines and structure for BDTA, eliminating the chances of non-business-related people poorly designing test automation frameworks that can result in deviations and increased maintenance costs. This eliminates the possibility of redundancies or deviations from the actual goal.

PLATFORM FLEXIBILITY

BDTA is not platform-dependent since it is not bound to a specific technology or platform, thus giving users the choice of using the app on the platform that best suits the business. This flexibility is a great boon that is missing in traditional test automation, where the app generally gets locked-in a single platform which cannot be changed.

REDUCES DOCUMENTATION TIME BDTA saves significantly on time, resources and efforts that generally go into frequent documentation and framework revisions. The reason is that changes in business goals are infrequent and consequently the same documentation and frameworks can be used multiple times without major revisions. This is a boon to Software and QA firms that have very stringent time, resource, and monetary budgets.

SCRIPT REUSABILITY BDTA is based on defined business rules, processes and keywords extracted from business goals. These remain unchanged for a long period of time, greatly enhancing script reusability and eliminating the need for frequent script changes and the baggage that comes with it.

SYNCHRONIZATION WITH SINGLE REPOSITORY

BDTA eliminates the need for creating separate repositories for maintaining business rules to create scripts, and access application rules. Thus, the BDTA set-up can work with a single repository of business and application rules, to greatly enhance synchronization.

In a nutshell, Business-Driven Test Automation is a strategic move that not only improves the efficiency of the testing process, but also contributes to overall business success, by aligning testing efforts with key business objectives.

Having explored the 'What' and 'Why' of BDTA, this Whitepaper moves into more practical territory, to see 'How' organizations can adopt this valuable approach.



THE 'HOW' OF BUSINESS-DRIVEN TEST AUTOMATION

This section unfolds a broad understanding of how BDTA is achieved, and presents a simple example to explain it in non-technical terms, for the benefit of a wider audience.

In practical terms, the BDTA approach is facilitated through intuitive and easy frameworks, devised for easily automating business-oriented tests. These provide interactive user interfaces, where Business Analysts and testers use normal English to automate the required business scenarios for testing, which the tool converts into programming language. The crux of BDTA is to sync automated testing efforts with business goals and priorities.



Steps for Implementing BDTA

- 01. UNDERSTANDING BUSINESS OBJECTIVES** It's important to collaborate with stakeholders to understand the business objectives in depth so as to avoid any ambiguity. Points to focus on, would include critical functionalities, user expectations, and Key Performance Indicators (KPIs).
- 02. DEFINING MEASUREMENT STANDARDS** Based on the objectives and inputs of all stakeholders, metrics must then be defined which will provide the basic guidelines for generating scripts, and getting consensus.
- 03. IDENTIFYING TEST SCENARIOS** Test scenarios that are vital for validating the app's functionality and performance are then identified and checked, for alignment with user stories and business processes.
- 04. CREATING TEST CASES** Next, test cases are developed for all identified scenarios, ensuring coverage of positive and negative scenarios; in a language that even non-technical stakeholders understand.

- 05. SELECTING AUTOMATION TOOLS** Automation tool selection needs proper attention as it should align with the technology stack of the app; and also facilitate easy collaboration and reporting.
- 06. IMPLEMENTING TEST AUTOMATION SCRIPTS** Based on the identified test cases, automation scripts that mimic user interactions with the app are written, keeping in mind the business perspective. Care needs to be taken to maintain optimal test coverage and minimal risk; confirming that outcomes are as expected. It's also important to ensure that these scripts are modular, maintainable, and easily understandable.
- 07. INTEGRATING WITH CONTINUOUS INTEGRATION (CI) TOOLS** Test automation is then integrated into the CI/CD pipeline to ensure that tests are automatically executed with each code commit, in order to facilitate early detection of errors, and simultaneously quicken the testing process.
- 08. CREATING REPORTING MECHANISMS** Reporting mechanisms are created to provide clear, crisp, value adding insights of the test results for easy understanding of business stakeholders – clearly stating whether the app meets the defined criteria.
- 09. MONITORING AND ITERATING** Frequent monitoring of the test automation suite's performance and effectiveness is needed, to ensure that changes in business requirements or new features, are incorporated early, in the test automation suite.
- 10. COLLABORATING WITH STAKEHOLDERS** Regular communication with business stakeholders helps to update them on test automation progress, results, and any identified issues. This will keep testing efforts aligned with business goals, transforming it into a strategic enabler for achieving business objectives, rather than merely being a technical exercise.

BDTA, as mentioned earlier, is a philosophy or an attitude towards testing. It's therefore important to understand how to practically incorporate the above-mentioned steps into the testing process. For a more hands-on understanding of the approach, a simple example of an e-commerce app is presented below:

Business Goal:

To enhance customer satisfaction by ensuring seamless and error-free shopping experience.



03

BDTA Approach for Each Stage of User Interaction

User Registration and Login

- **Business Goal:** Simplification of onboarding process to improve user experience.
- **Automated Test:** Creating automated tests to ensure that the user registration and login processes are smooth and error-free. This includes validating email verification, password reset functionalities, and secure login.

Product Search and Navigation

- **Business Goal:** Facilitating easy product detection for customers.
- **BD Automated Test:** Implementing automated tests for product search functionality, category navigation, and filtering options to ensure customers can find products quickly and efficiently.

Shopping Cart and Checkout

- **Business Goal:** Streamlining the checkout process to reduce cart abandonment.
- **BD Automated Test:** Developing tests for adding products to the cart, updating quantities, and completing the checkout process, including easy application of discounts and special offers. Ensuring that payment gateways work seamlessly, and orders are processed accurately.

Mobile Responsiveness

- **Business Goal:** Catering to the growing mobile user base and providing a responsive design.
- **BD Automated Test:** Executing tests to validate the responsiveness of the website across various devices and screen sizes. Ensuring that the user interface remains intuitive on mobile devices.

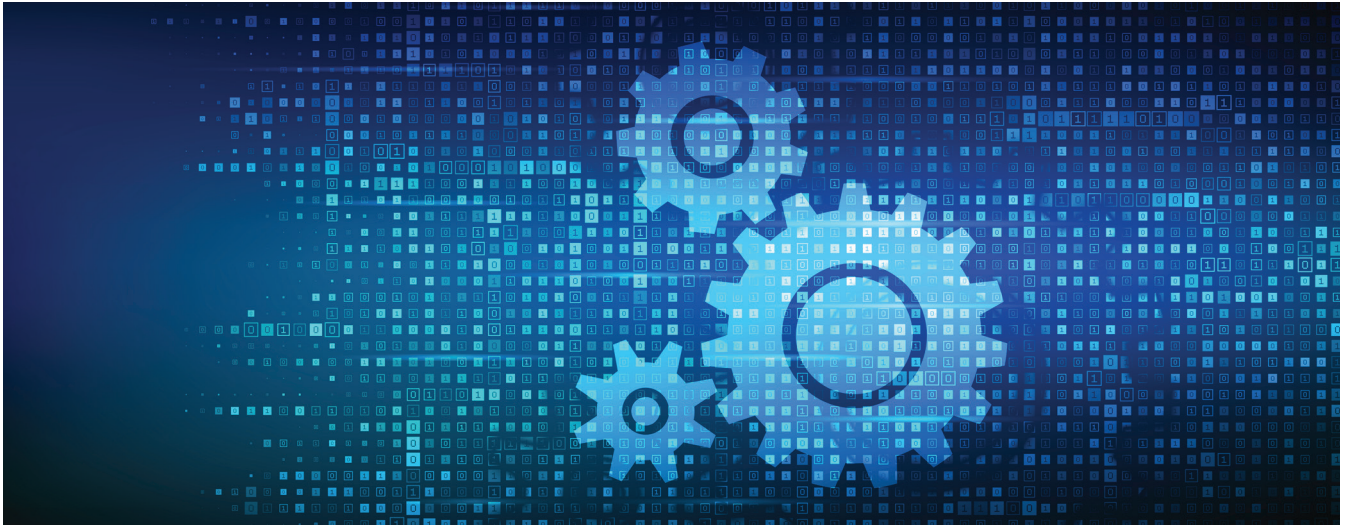
Performance Testing

- **Business Goal:** Delivering a fast and reliable shopping experience.
- **Automated Test:** Implementing performance tests to evaluate the platform's response time, scalability, and reliability under different load conditions. Ensuring that the website can handle peak traffic without performance degradation.

Error Handling and Logging

- **Business Goal:** Minimizing disruptions and providing a helpful error resolution process.
- **Automated Test:** Creating tests to simulate error scenarios, such as entering invalid data during checkout or encountering server errors. Ensuring that error messages are user-friendly and that incidents are logged for analysis.

While this Whitepaper ends here, it is hoped that readers will be able to take this valuable BDTA philosophy into their workplaces and practically adopt it, in order to unfold the many benefits that it offers all stakeholders – Business Owners, Business Analysts, IT Solution Firms, and of course the QA team.



CONCLUSION

In today's digital world where user's app experience can contribute to building or denting the company's bottom line, it is important to adopt newer technologies, methodologies, and philosophies that promote superior user experience. Undoubtedly then, BDTA which serves the twin objectives of enhancing business profitability, as well as superior user experience, must become the preferred option, as it feeds both birds with one stone!

BDTA places the testing emphasis on achieving effectiveness, quality and superior performance of software solutions in line with business objectives. Testing time, resources and efforts thus get channelized into realizing business goals and enhancing business profitability. In order to accrue the many advantages of BDTA, the automation tool selection should be a well-informed decision. Select a tool that supports collaboration, as this is vital for the BDTA approach, and also offers verified codeless testing, while consistently incorporating the latest in technology.

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