

SOFTWARE TESTING AND AUTOMATION

*Project report submitted in partial fulfillment of the requirement for
the degree of*

BACHELOR OF TECHNOLOGY IN ELECTRONICS AND COMMUNICATION ENGINEERING

By

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UNDER THE GUIDANCE OF

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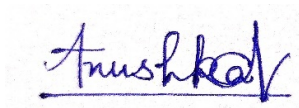
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DECLARATION

I hereby declare that the work reported in the B.Tech Project Report entitled “SOFTWARE TESTING AND AUTOMATION” is a **CONTINUOUS DEVELOPMENT PROGRAM** submitted at **Jaypee University of Information Technology, Waknaghat, Solan, Himachal Pradesh**, is a unique record of my work that is done under the guidance of HOD , **Dr. Rajiv Kumar**. I have not submitted this work elsewhere for any other degree or diploma.



(Signature of Student)

171059

This is to certify that the statement stated above is true and the candidate is correct to the best of my knowledge.



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LIST OF ABBREVIATIONS

1. CSD : Continuous Skill Development
2. UFT : Unified Functional Testing
3. QTP :Quick Test Professional
4. VB : Visual Basic
5. SQL : Structured Query Language
6. RDBMS: Relational Database Management System
7. SDLC : Software Development Life Cycle
8. STLC : Software Testing Life Cycle

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ABSTRACT

At Cognizant they invest in ability and capability development of the field selects. This is often through Cognizant Place and Continuous Ability Development (CSD) program. This forms a crucial part of our employment with Cognizant. CSD program is obtainable through a platform based mostly engagement model combined with integrated ability assessment and certifications because the CSD program completion criteria. Place is a chance for all field selects to attain business readiness even before the aboard with Cognizant.

Every intern spends bound coaching hours across core skills, active and behavioural learning. Additionally, we tend to work on Business aligned use cases as a part of their project part throughout project section alongside needed coaching to realize a lot of confidence on technology areas.

Keeping in mind the competitive and career blessings of constant learning, Cognizant Academy is on a mission to remodel associates into curious learners and facilitate them become active participants in clients' digital transformation journey furthermore as Cognizant's growth story. Being the in-house learning and development wing of the organization, Cognizant Academy is targeted on creating associates future-ready through role-based and business-aligned learning solutions

MOTIVATION

Internship could be a nice platform for us to leap begin our career. Internship offers a novel chance for us to realize skills that produces us. business prepared. There are a unit different edges starting from engaged on business case, to earning a regular payment. They but emphasize on business-focused learning because the key issue that ought to encourage us to pursue place.

CHAPTER 1

INTRODUCTION

1.1 GenC learning Program

Gen C learning program engages young abilities with a comprehensive learning pathway, giving the millennials a chance to move with subject material specialists (SME), perceive the company setting, and groom themselves cognizant emphasizes on Learner Autonomy wherever students take control of their own learning, with the offered tools and resources. Additional focus is on “learning” than “teaching”.

1.1.1 Following Milestones to HC Facets and UFT Automation:

- Milestone1:FunctionalTesting
- Milestone2:DataSource–SQL,XML&JSON
- Milestone3:VBScript
- Milestone4:UFTAutomation,ProjectDeliverables
- Milestone5:HCFacets,ProjectDeliverables

1.2 Learning Journey with Culture of Work from Home

This program encourages United States to be a lot of autonomous learners throughout guided self- learning hours, finishing the training objectives on our own pace and magnificence, and obtain prepared for the active observe time.

1.3 Learning Path

1.3.1 WEEK SCHEDULE

WEEK 1

- Agile Methodologies& PhasesSTLC
- Basics ofAutomationconcepts
- Quizes & CodingChallenges

WEEK 2

- DataSource(SQL,XML,JSON)
- Quizes CodingChallenges
- VBScriptProgrammingQuizes&Coding

WEEK 3

- VBScriptProgramming
- Quizes &CodingChallenges

WEEK 4 TO 7

- UFTAutomation
- Quizzes & CodingChallenges
- ProjectDeliverables
- ICT (Integrated CapabilityTest)

WEEK 8 & 9

- Health CareFacets
- ProjectDeliverables

1.3.2 Overview

Cognizant has collaborated with Udemy to supply world category learning videos for the evolving way forward for work. These Udemy programs area unit plain-woven into a learning path, empowering you to set up and learn at your vogue. The program additionally connects you with subject material consultants to induce the skilled steering on your queries within the learning journey .The program unceasingly evaluates if you area unit ready to use those self-learnt skills to solve a business downside. Delineated below area unit the three key learning parts, which area unit distributed across the educational journey for the aim of continuous analysis. You have to attain a minimum of seventieth in every of the key parts.

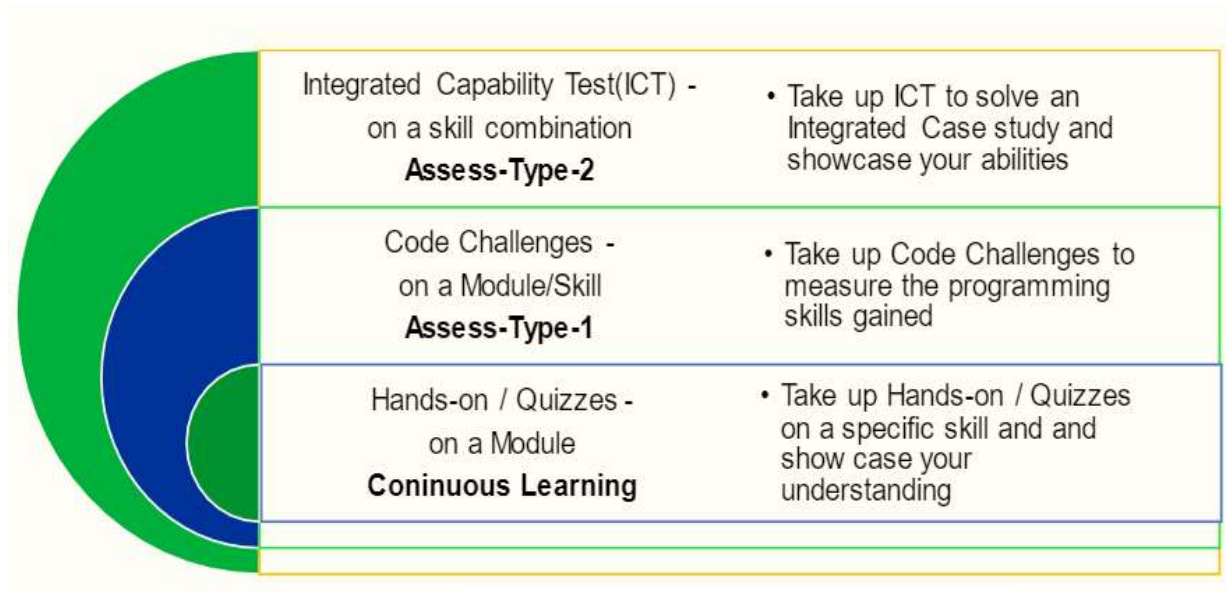


FIG 1: Learning Schedule and Scheme

CHAPTER 2

SOFTWARE TESTING

2.1 SDLC – SOFTWARE DEVELOPMENT LIFECYCLE

The process followed within the development teams of a software. It's an in depth process of the way to create, develop, test and maintain the software. SDLC helps in creating quality products while maintaining a fanatical process to figure through the event of it.

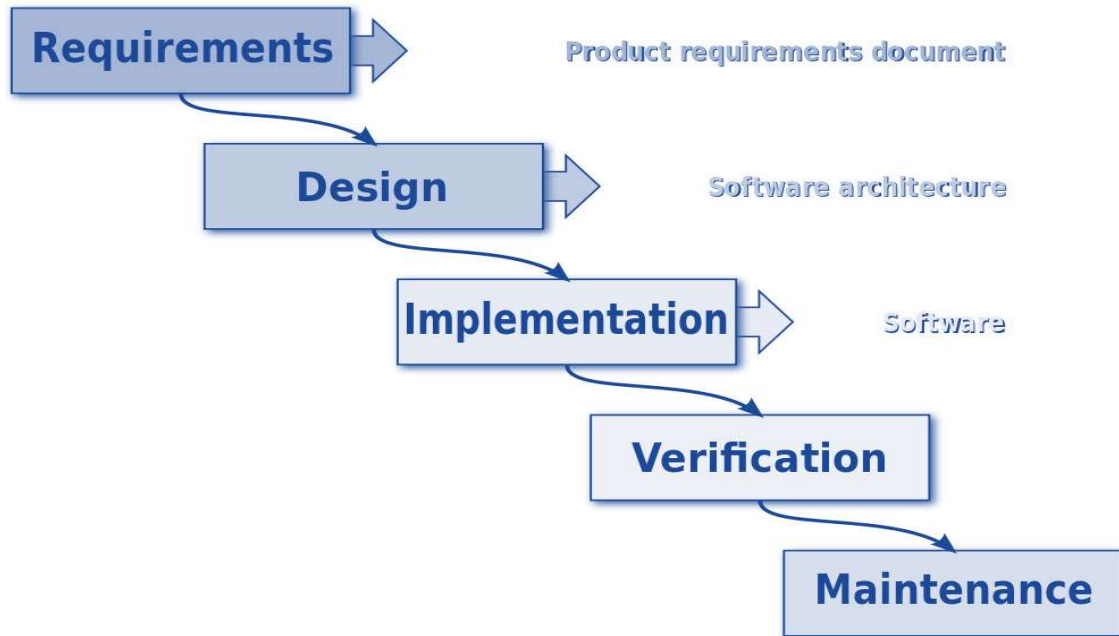


FIG 2.1: Software Development life cycle

2.1.1 PHASES:

- **User Requirement**—In an SDLC, that is the 1st and most significant section for a package program task's success. Throughout this section, story takes area among stakeholders, end-users, and task teams, as each wise associated non-practical desires a hyperbolic and positive from shoppers. The requirement Gathering & Analysis section of SDLC entails the following Analysis of capability and money practicability distinctive and taking photos desires of stakeholders through consumer interactions like interviews, surveys, etc. Clearly method associate degreed documenting consumer desires in associate SRS (Software Resource Specification Document) comprising of all product desires that require to be developed creating task prototypes to reveal the end-consumer but the task will look.
- **Design** —This turning out with a part of SDLC involves the Separation of hardware and package wants , coming up with the system style supported gathered wants and making Unified Modelling Language (UML) diagrams like- use cases, class diagrams, sequence diagrams, and activity diagrams.

- **Implementation** –After the architecture of the software have been designed, next step is to implement it. It is segregated into smaller units and are developed in this phase. Each unit has its own functionality, which is defined in the user requirement document.
- **Integration and Testing** –SDLC's making an attempt stage alludes to checking, announcing, and fixing the framework for any bug/imperfection. During this stage, the on-going framework or task is resettled to a take a look at climate wherever distinctive testing structures square measure performed. During this step all the units' square measure tested on an individual basis for any faults or defects, or any practicality not operating properly. All the units' square measure then integrated into a system for additional method.
- **Deployment and Maintenance:** In this SDLC stage, once the framework testing has been done, it's suited be sent. The framework can be initially delivered for restricted shoppers by testing it in an exceedingly real business climate for UAT or User Acceptance Testing. The preparation and Maintenance section incorporates that the framework is ready for delivery, the framework is introduced and used Errors area unit corrected which will are recently incomprehensible. Additionally, enhancing the framework within an information centre.

2.2 Development lifecycles can be divided into types:

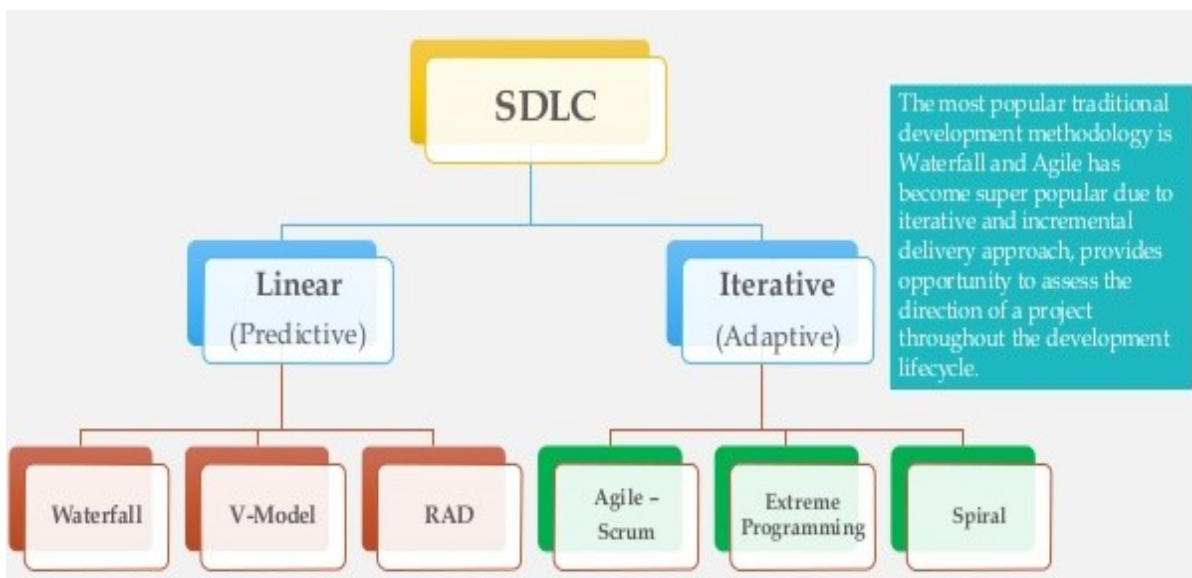


FIG 2.2: Types of SDLC

2.2.1 SEQUENTIAL:

It is the more seasoned methods of fostering a product. It is a less difficult interaction wherein stages don't cover and are continued in a consecutive way. It has a beginning for example at the point when the client have a plan to create, it is then trailed by the prerequisites expected to make that thought. At that point the plan of the product is spread out, trailed by the form. The form is then tried and fixed in the following stage and after fruitful finishing of this stage the product is delivered to the clients or customers.

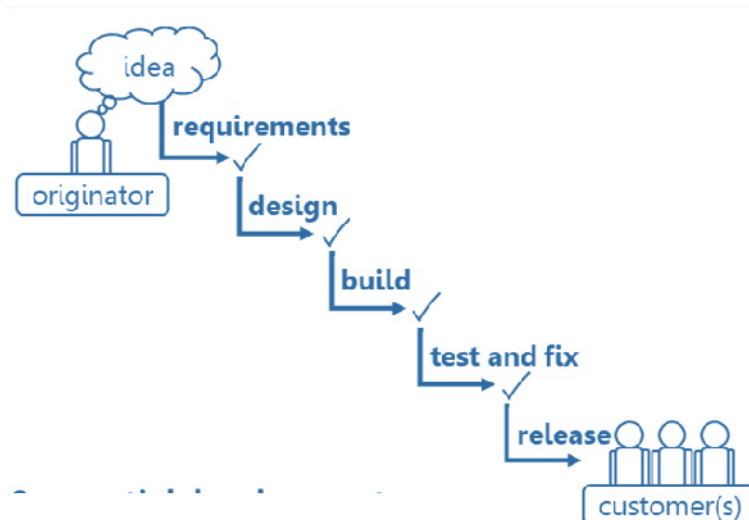


FIG 2.3: Sequential phase wise Model

2.2.2 Two types of Sequential models that are used are:

- a. The Waterfall Model
- b. The Validation and Verification Model

Waterfall Model

It follows a linear structure and the activities are completed sequentially one after the other. In waterfall model we go from high level to low level. We don't come back to the previous step amid of the current one. It is best applicable for smaller projects where the requirements are well defined.

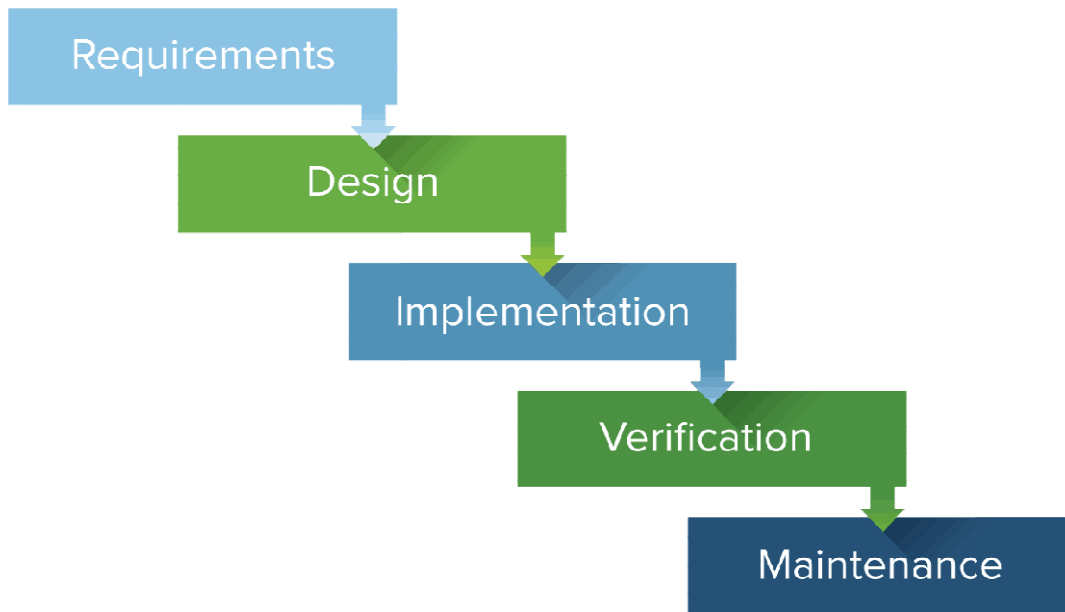
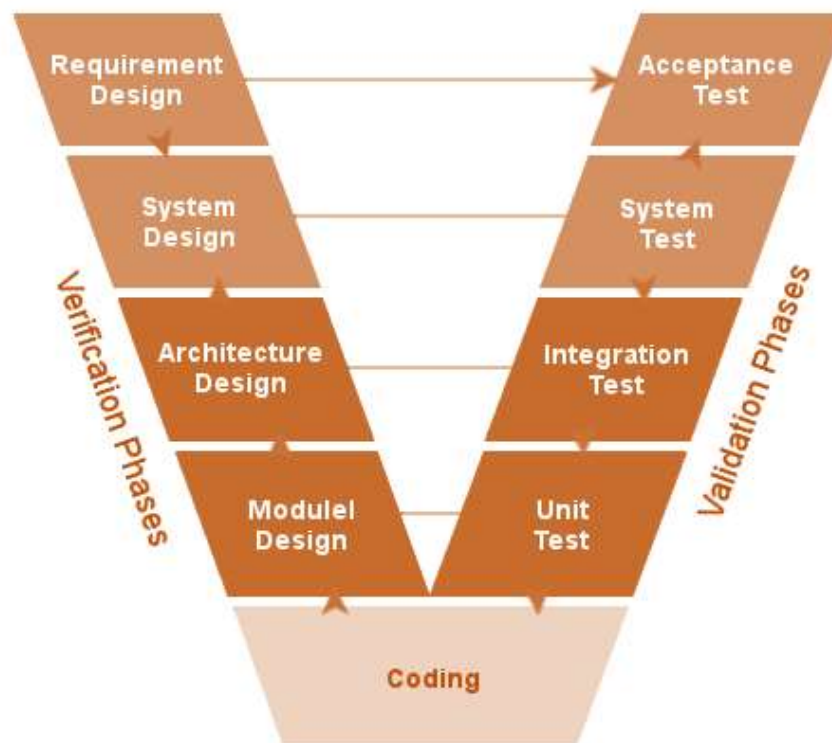


FIG 2.4: Waterfall Model

V-Model

V-Model is also a sequential model but it's different from waterfall model in a way that the software is divided into two parts User requirements and Software requirements. This model has more emphasis on testing by parallel testing phases along with development. Due to simultaneous testing, also known as Validation and Verification or V- model. It overcomes the faults of the waterfall model that testing starts after the development cycle of the



software.

FIG 2.5: V Model

2.2.3 Iterative Model

In iterative model we partition the product into emphases of layers. It gets going with a less complex variant with every cycle expanding its usefulness and advancing its executions. The best element of this model is that there will be a functioning framework model at the early piece of the turn of events and can be based upon iteratively while keeping the coordination of parts and the usefulness in the check.



FIG 2.6: Iterations in Iterative Model

The iterative life cycle model contains rehashing the underneath referenced four phases as a succession. These are:

USER RequirementPhase:In the requirements amount of programming improvement, the framework connected knowledge is accumulated and investigated. The gathered stipulations are then organized in like manner for fostering the framework.

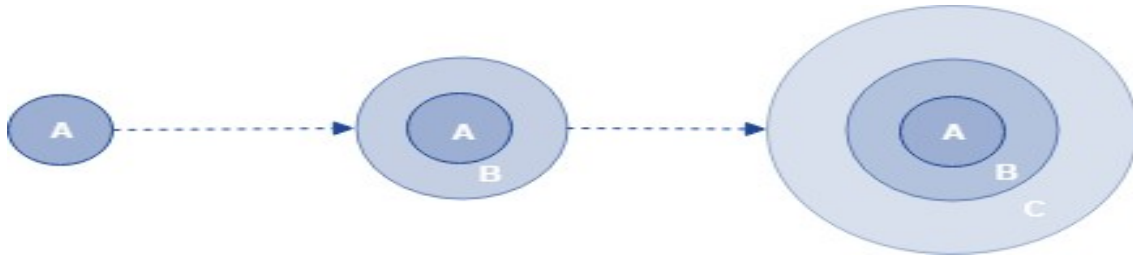
The DesignPhase:In the style stage, the merchandise arrangement is about up to satisfy the wants for the set up. The framework configuration may be another one or the growth of a past type one.

Execution and Testing Phase:In execution even as a take a look at stage, the framework is formed by secret writing and building the UI and modules that is then united and tried.

ReviewPhase: The survey stage is where the product is assessed and checked according to the current necessity. At that point, further necessities are explored examined and surveyed to propose for an update in the following emphasis.

2.2.4 Incremental Model

In incremental model the user requirements are broken down into smaller units and then that part is of a section is finished before moving on to the next one. The smaller units are standalone modules that can function on their own. In incremental model fundamental requirements are addressed first and then the secondary functions are added in forthcoming



increments.

FIG 2.7: Iterations in Incremental Model

2.3 Software Testing

Software Testing is an interaction to evaluate the nature of the created programming while

lessening the danger of its disappointment too. Since Software testing incorporates numerous exercises that is the reason it is known as a cycle. It tends to be of two sorts Dynamic Software Testing and Static Software Testing. Dynamic Software testing incorporates the execution of the product though in the Static Software Testing we don't execute the code, we simply survey the code and its plan and so on.

Validation and Verification are two major activities. Validation means building the right product according the user requirement. Verification means we build the product right that is its design, architecture and speed.

Work Products are anything that is produced while we are working inside our software.

Example: Requirement, Codes and Design.

2.3.1 Test Process

Testing is that the manner toward assessing a framework or its component(s) with the aim to find if it fulfils the predefined requirements. In easy words, testing is corporal punishment a framework to acknowledge any holes, mistakes, or missing conditions con to the important requirements.

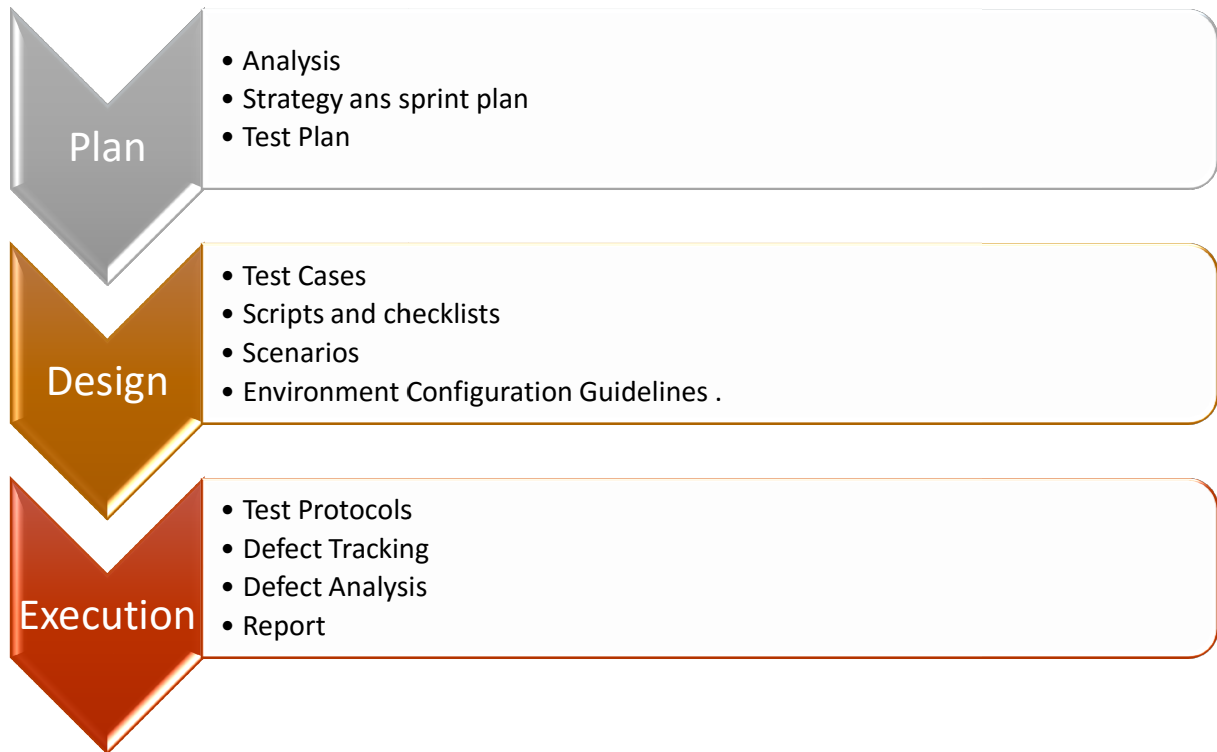


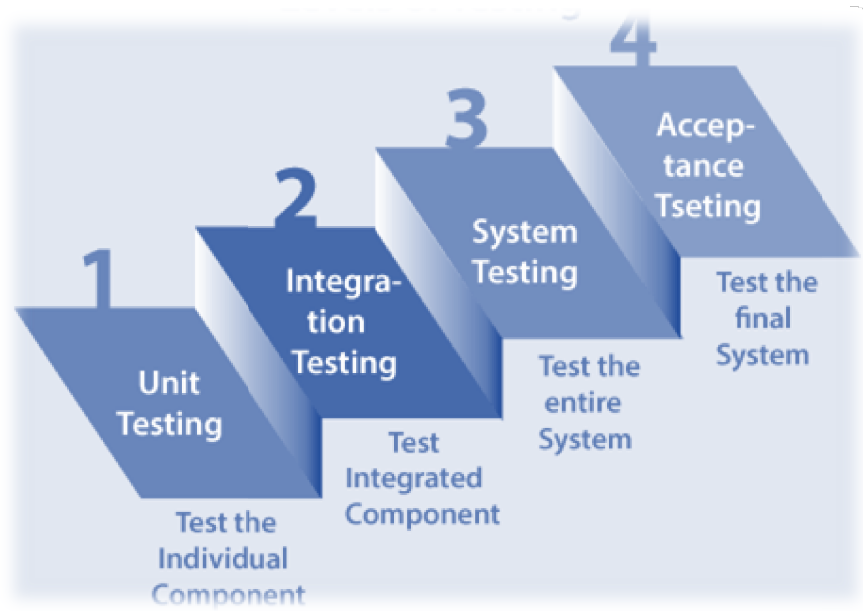
FIG 2.8: TEST PROCESS

Test Process Steps:

1. Test Planning – It is the documentation of the Test Plan. In this we document all our test related data, including reviewing the basis of the test.
2. Test Monitoring and Control – In this we monitor our progress regarding the test of the software whereas also keeping in control so that the path doesn't differ from the goal.
3. Test Analysis – In this we search the defects and analyse the test conditions.
4. Test Design – This is where the different test cases are written.
5. Test Implementation – Here we organise the test cases in the environment (browser, operating system. Etc)
6. Test Execution – It is the step involving reporting the whole process, retesting the reworked functionalities and regression.
7. Test Completion – After all the previous test are completed, it leads to the completion of the process.

2.3.2 Test Levels

Testing levels are fundamentally to distinguish missing regions and forestall cover and reiteration between the advancement life cycle stages. It is used to check from functionalities, performance to the integration of its components.



1. Unit Testing – It is the most basic unit of the system that can be tested separately, it could be modules or classes of the code. It is basically done by the developer during the development stage.
2. Integration Testing – It can be subdivided into two parts Component Integration and System Integration. Component Integration is the integration between the components and is usually done by the developer. On the other hand, System Integration is done in bigger projects which may include many systems like frontend, backend, etc. It is usually done by the tester.
3. System Testing – It is the most important testing in this we test our system in the real environment. It checks everything including integration among components, its stability and performance as well as the security.
4. Acceptance Testing – It is mostly done by the user / stake holders. It is done to check that all the user requirements have been met as per the user requirement document.

FIG 2.9: Testing Steps

2.3.3 Testing Types: There can be many times of testing. Few important ones are listed below:

1. Functional Testing – The process through that QAs confirm if a touch of software system is acting in accordance with pre-determined needs .It tests what the system will.
2. Non – Functional Testing - In this testing all the non – functional tests are performed. Performance Testing is done to test how the system is working. Stress Testing is done to check how much load the system can take. It is hard to answer in Yes/No and is usually answered in a range.
3. Black box Testing – In black box testing the tester is not known to the internal structure of the system. The tester can only give an Input and check if he had received the appropriate output.
4. White box Testing – In this we do testing while monitoring the internal structure of the system.
5. Dynamic Testing – Testing involving the execution of the system is known as Dynamic Testing.
6. Static Testing – In Static testing there is no execution of the system, it is basically used for reviewing the design and code of the system.
7. Retesting – It is also known as Conformational Testing. It is done when changes are made by the developer after a bug was reported. It uses the same steps to test that caused the defect.
8. Regression Testing - It is done when the developer changes something i.e. changing the requirement, adding new functionalities, or removing a feature.
9. Smoke Testing - Smoke Testing is testing the main functionalities to ensure that the build is stable enough for testing.

Difference between Regression testing and retesting is that Regression testing is performed for breezed through assessment cases while Retesting is done uniquely for failed test experiments. Regression testing checks for unforeseen results while Re-testing ensures that the first shortcoming has been rectified.

2.3.4 Test Case Writing

Test Case may be a set of preconditions, inputs, and actions (where applicable), expected results and post conditions developed supported check conditions.

1. Test Case Title – Title should be suitable,appropriate and should be informative.
2. Precondition – Condition performed before testing.
3. Test Steps – Sequence of step that should be carried out inorder to perform a test. They should be very clear keeping the important things marked.

- High Level Test Case –When we don't provide exact credentials for checking because it is written before/while software is under development.
 - Low Level Test Case –In a deeper way they define the functionality
4. Expected Result – It contains what the expected result is from the system after the test steps are followed.
 5. Test Scenario – Test Scenario or Test Suite is grouping of similar test cases into one Suite.
 6. Test Environment – In this we mention the specifications of the hardware, software and the network used.
 7. Actual Result - Result obtained after executing the test case.
 8. Status – Indicates the current status of the test case.
 - New – Needed to be tested
 - Pass – On execution of the test case expected result is same as the actual result
 - Fail – On execution of the test case expected result is not same as the actual result
 - Blocked – the test case cannot be executed due to a blocked functionality

2.4 Bug Report

Documentation of the occurrence, nature and testing of a defect. A bug occurs when expected result don't match the actual result.

1. Bug Report Title – It includes the Description; enough information is provided in the title.
2. Steps to reproduce – It's the steps that leads to the bug, must be very specific.
3. Expected Result - What should have happened after the execution
4. Actual Result – What really happened when the steps were executed.
5. Test Environment – Device/Operating System/Network used for the execution of the test case.
6. Screenshot/Video – Further on media can be attached to the report to make a clear point. It should show full screen, a red rectangle around the defect area and the video should show mouse clicks as well as keyboard key presses.
7. Bug Priority – Indication level of the priority of the bug.
 - Critical –A functionality of the system does not work.
 - High – Non-Functional defects or low priority functional defects.
 - Medium – Minor performance defects or UI display defects
 - Low – Defects like spelling mistakes or Image misalignment.

2.5 Black box Testing

Black Box testing has the aim to test the behaviour of the software. It is done without knowing the internal structure of the system. There are four major ways in which black box testing can be done.

1. Equivalence Partitioning (EP) – In equivalence partitioning the system is split into partitions (may not be of a similar size). One legal action is performed for every

- partition. In EP it's smart to draw the quantity line. Before and when cases are provided for the buffer, these square measure referred to as invalid Partitions
2. **Boundary Value Analysis (BVA)** – it's associate extension over EP technique, in BVA we are going to check for the boundary values moreover. We tend to study 1st worth in current partition and also the last worth within the previous partition. Every worth can belong to only 1 partition.
 3. **Decision Table Testing** – Totally different mixtures of conditions end in different outcomes. Variety. The number of tables for n number of questions with m possibility is m^n .
 4. **State Transition Testing** –System which has the different transitions.

2.6 WhiteBox Testing

WhiteBox testing techniques analyse the inner structures which is used information structures, internal style, code structure and therefore operating code instead of simply the practicality as in recording machine testing. It is conjointly referred to as the glassbox testing and even clear box testing or structural testing.

2.6.1 WorkingProcess of WhiteBox testing:

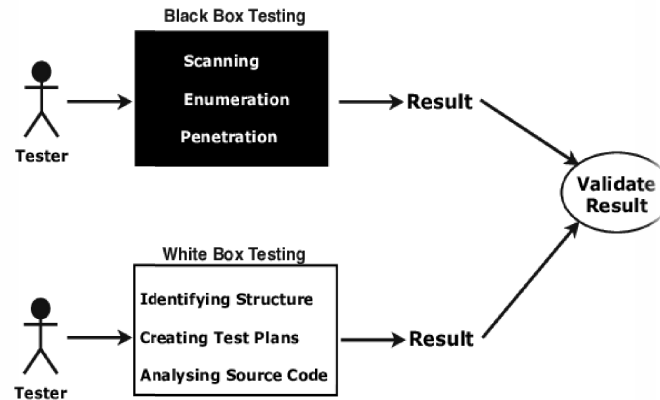
- **Input:** wants, purposeful specifications, vogue documents, code document
- **Processing:** enjoying risk analysis for guiding through the whole technique
- **Proper check planning:** bobbing up with check cases so on cowl entire code. Execute rinse-repeat until error-free code is reached. Also, the results square measure communicated.
- **Output:** preparing final report of the whole testing technique.

2.6.2 Testing Technique

1. **Statement Coverage** – It covers all the statement inside the code and have hundred percent statement coverage.
2. **Decision Coverage** – Tests all the decision outcomes in the code. It is also known as the branch coverage.
3. **Condition Coverage** – Test each condition in the case in true and false cases.
4. **Path Coverage** – Tests all the paths present in the code.
5. **Modified Decision**– It tests only important conditions.

2.7 Comparison between Black Box and White Box Technique

FIG 2.9:
Black Box and
Technique
2.8 Agile Four



Comparison:
White Box
Values

1. Individual and Interaction over Process and Tools –It is interaction with the people and Relations between is additional vital than a method or a tool. For Example : Communication is associate example of the distinction between valuing people versus Method.
2. Working Software over Comprehensive Documentation: It streamlines it in a very type that provides the developer what's required to try to the work while not obtaining caught up in trivia. Agile documents desires as user stories, that square measure tight for a code developer to begin the task of building a different operate
3. Consumer collaboration over Contract Negotiation –Agile declaration describes a shopper WHO is engaged and collaborates throughout the event methodology, making. This makes it method easier for development to satisfy their needs of the Customer who is a client.
4. Response to the changeover following the planning – Have the flexibility to be able to make changes to the plan and not follow it too strictly.

2.8.1 Whole Team Approach

In Agile, the whole-team approach suggests that involving everyone with fully completely different knowledge and skills to substantiate project success. The team includes representatives from the shopper together said because the merchandise Owner, and completely different business stakeholders administrative body make sure product choices. Ideally, the total team shares a similar space and is supported through the daily stand-up conferences involving all members of the team, where work progress is communicated and any impediments to progress unit of measurement highlighted. The whole-team approach promotes easier and economical team dynamics. The construct of involving testers, developers, and business representatives all told feature discussions is thought because the power of 3, or the 3 Amigos. The use of a whole-team approach to development is one in each of the foremost benefits of agile development. Its benefits include:

- Enhancing communication and collaboration among the team
- Enabling the numerous ability sets among the team to be leveraged to the advantage of the project
- Making quality everyone's responsibility

CHAPTER 3

MYSQL, JSON AND XML

3.1 MySQL

MySQL is a RDBMS i.e. Relational Database Management System which supports the SQL Structured Query Language that is language for accessing and managing the records within the information.

SQL stands for Standard query language and is used to communicate with the databases. Used for performing task on the Database.

3.1.1 DATABASE: An application that stores the organized assortment of records. It square measure usually accessed and manage by the user really merely. It permits to rearrange information and records into tables, rows, columns, and indexes to hunt out the relevant information quickly. Each info contains distinct API for arts info operations like creating, managing, accessing, and searching out the information it stores.

3.1.2 Key Difference between SQL and MySQL

Difference	SQL	MySQL
Definition	A query language	A relational database that uses SQL
Operations	Performs operations on data in a database	Stores the existing data in an organized manner in its database
Functions	Writes queries for databases	Stores, modifies, and manages data in a tabular format
Format and Syntax	Remains the same	Keeps updating
Support	No support for its connector	Has MySQL workbench integrated tool
Storage Engine	Supports a single storage engine	Supports multiple and pluggable storage engines
Server and Database	The server remains independent of the database	The server blocks the database during a data backup session

TABLE 3.1: Difference between MySQL and SQL

3.2 Working of MySQL

MySQL follows the operating of Client-Server design. This model is meant for the end-users noted as shoppers to access the resources from a central laptop referred to as a server victimization network services. Here, the consumers produce requests through a graphical package (GUI), and conjointly the server will offer the desired output as shortly as a result of the directions square measure matched. The operating of MySQL info with MySQL Server square measure as following:

- MySQL creates associate information that allows you to create many tables to store and manipulate data and shaping the association between each table.
- Clients build requests through the GUI screen or transmission by victimization specific SQL expressions on MySQL.
- Finally, the server application will respond with the requested expressions and switch out the desired result on the client-side.

3.3 RDBMS

Relational Database Management System is a collection of data into organised tables. Tables in RDBMS are linked together (or can be linked together). They are also capable of storing common tables.

3.4 JSON / JavaScript Object Notation

JSON stands for **JavaScript Object Notation**. JSON may be a light-weight format for storing and transporting information. It is unremarkably used once information is distributed from a server to an internet page. JSON is "self-describing" and straightforward to know.

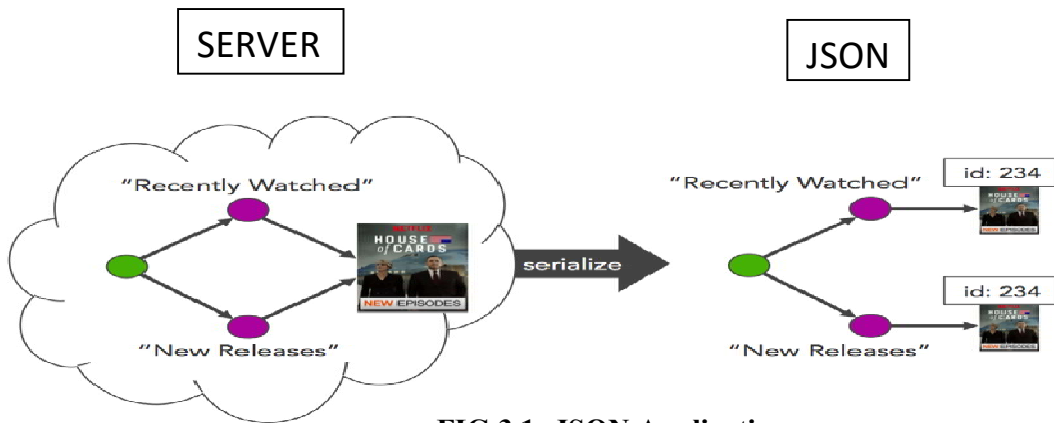
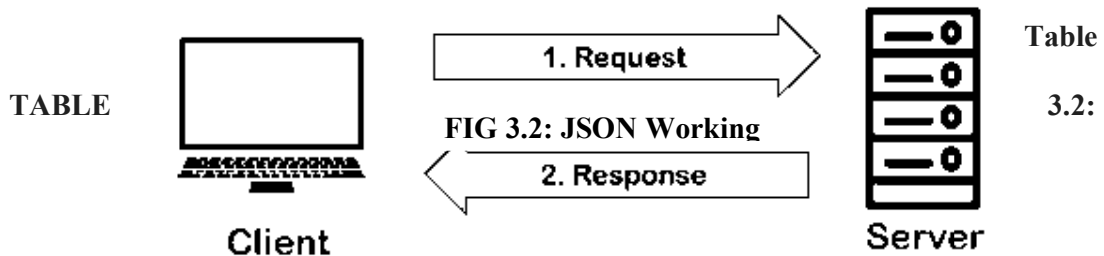


FIG 3.1: JSON Application

JSON has been made up on 2 structures:

1. A collection of name/value pairs. In various languages, this could be completed as Associate in Nursing object, record, struct, dictionary, hash table, keyed list, or associative array.
2. Anordered list of values. In most languages, this could be completed as Associate in making array, vector, list, or sequence.



JSON	XML
Text based format (Not a Language)	Markup Language
Free to define anything	Has some rules
Smaller Size	Big in Size due to markups
JSON is similar to Java script Objects literals. Browser read faster.	Browser need parsers to handle XML. Slow processing.
No support on namespaces and comments	Both are supported.

Comparison of JSON and XML

These are universal data structures. Nearly all trendy programming languages support them in one sort or another. It's good that Associate in nursing data format that is interchangeable with programming languages even be supported these structures.

3.5 XML

XML (Extensible Markup Language) could be a nomenclature just like hypertext Markup language, however while not predefined tags to use. Instead, you outline your own tags designed specifically for your wants. Most significantly, since the essential format of XML is standardized, if you share or transmit XML across systems or platforms, either domestically or over the net, the recipient can still take apart the data attributable to the standardized XML syntax.

3.5.1 Why Extensible Markup Language?

Platform Independent and Language Independent: The good thing about xml is that you simply will use it to require knowledge from a program like Microsoft SQL, convert it into XML then share that XML With different programs and platforms one will be able to communicate between 2 platforms that are usually terribly troublesome.

3.6 Key Difference between JSON and XML

JSON is quicker as a result of it's designed specifically for data interchange. JSON secret writing is elliptical, that wants less bytes for transit. JSON parsers square measure simpler, that wants less interval and memory overhead. XML is slower, as a results of it's designed for many quite merely data interchange.

CHAPTER 4

VISUAL BASIC SCRIPT AND UFT AUTOMATION

4.1 DEFINITION

VBScript (Visual Basic Script) is all-purpose, light-weight and active scripting language developed by Microsoft that's sculptural on Visual Basic. Nowadays, VBScript is that the primary scripting language for fast take a look at skilled (QTP) that could be a take a look at automation tool. It is just like JavaScript and preferred over client side

The 3 environments at which VB Script can be implemented.

1. **Internet Information Server (IIS)** – Microsoft's web server
2. **Windows Script Host(WSH)**– The native hosting environment of the Windows OS
3. **Internet Explorer(IE)**–The simplest hosting environment we can use to run VBScript.

4.1.1 FEATURES INCLUDE:

- VB Script may be a scripting language developed by Microsoft.
- It is a light-weight version of Microsoft Visual Basic and also the VBScript syntax is extremely almost like that of Visual Basic.
- VBScript program has to be hosted on any of those three environments: IIS (Internet data Server) – Microsoft's own internet server software system WSH (Windows Scripting Host) – The native hosting atmosphere of the Windows OS IE (Internet Explorer) – the only hosting atmosphere we are able to use to run VBScript VB Script will solely run on Windows machines and net individual browser.

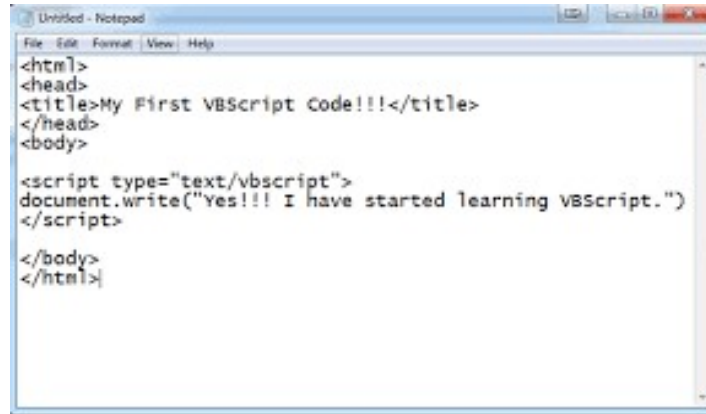
4.1.2 How Do We Create a Simple VBScript?

To make and run a VBScript, we require:

- Editors including Notepad++ or perhaps Notepad to jot down the VBScript Code.
- Internet Explorer (good to own that is 6 or above) for the VBScript Code.

4.1.3 Working with VBScript

1. The first
Here we print a
IE (Internet
. The way to
Script:



```
Unbitled - Notepad
File Edit Format View Help
<html>
<head>
<title>My First VBScript Code!!!</title>
</head>
<body>
<script type="text/vbscript">
document.write("Yes!!! I have started learning vbscript.")
</script>
</body>
</html>
```

VBScript:
sentence on
Explorer)
embed VB

FIG 4.1: VB Script use in Notepad

2. Case Insensitive: This means that any keyword or variable written will be treated same irrespective of the case is treated the same. For example, variables ANUSHKA and anushka will be treated the same.

3. Variables rules to follow while working .

Following are the rules:

1. Alphabet should be the start of a variable.
2. The variable names can have maximum 255 characters.
3. Unique variable names (being insensitive this is with the spelling also) .Using the keyword 'dim' variables are declared .Declared using 'dim'.

4. Decision Making

With the help of conditional statements it makes decision .


```

1 <html>
2 <body>
3 <script language = "vbscript" type = "text/vbscript">
4   Sub Function(value)
5     If value = 0 Then
6       document.write("The value is 0")
7     End If
8   End Sub
9
10  Function()
11 </script>
12 </body>
13 </html>

```

FIG 4.2 Use of Decision Statement

5. Looping through the code.

To implement Logic ,The while , do while , for loops are used .

```

1 <!DOCTYPE html>
2 <html>
3 <body>
4 <script language = "vbscript" type = "text/vbscript">
5   Dim a : a = 10
6   For i = 0 to a Step 1
7     document.write("The value is i is : " & i)
8   Next
9
10 </script>
11 </body>
12 </html>

```

FIG 4.3: Use of Loops

4.2 Advantages

- It is accustomed script body tasks on Windows (but currently, it's chiefly replaced by Windows PowerShell).
- It is that the scripting language for quick take a glance at ball-hawking (QTP), a good used take a glance at automation tool. It's the inside scripting language for embedded applications.
- DBMS Intersystem Cache put together implements VBScript.
- It has sturdy support for error handling, subroutines, etc.

4.3 Unified Functional Testing (UFT)

Also known was QTP which stands for Quick Test Professional, taken over by Micro Focus. QTP is intelligent take a look at automation for net, mobile, API, hybrid, RPA, and enterprise apps. N QTP is currently referred to as UFT i.e. (Unified purposeful Testing). it's machine-driven an automatic } Testing tool that helps testers to execute automated tests thus on spot any errors, defects or gaps in contrary to the expected results of the appliance beneath check.

4.3.1 Brief History Of UFT

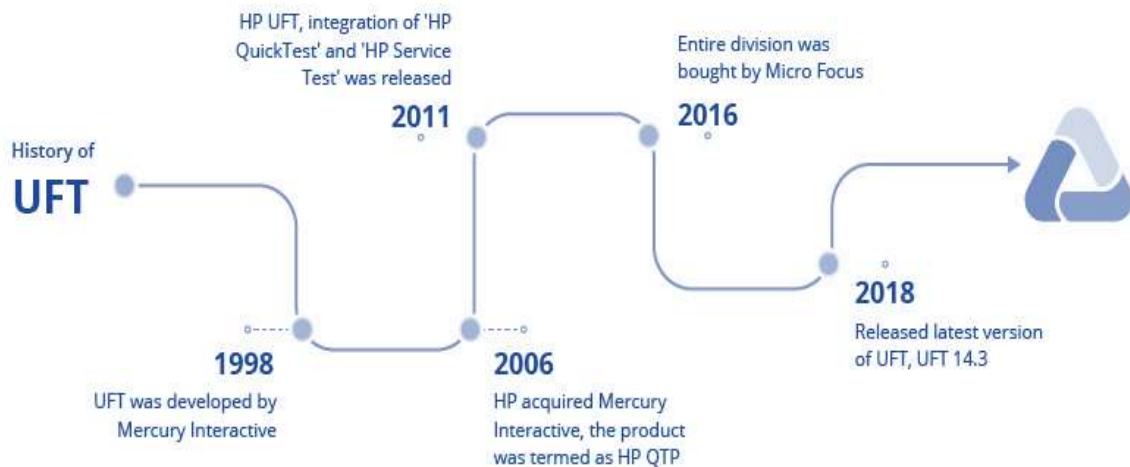


FIG 4.4: History of UFT

The Best Testing Tool is UFT because:

- It is Associate in Nursing icon-based tool that automates the regression Associate in Nursing purposeful Testing of an application
- Both technical, additional as a non-technical tester, used as QTP
- It provides every features- Record additional as Playback
- One will check Desktop additional as a result of the Web-based applications
- It permits Business methodology Testing (BPT)
- QTP Testing is based on scripting language VB script
- Micro Focus's UFT uses VBScript to automatize applications.

4.3.2 Why is there Automation?

Manual testing of any web-based application and desktop/standalone application takes time, resources and money. Also. It's intolerable to quickly check applications at any random time with none manual intervention. Automation comes into image here to chop back or eliminate the manual testing the utmost quantity as potential.

4.3.3 Standard Automation Framework Requirements

- Code should be re-usable, perceivable and rectifiable.
- Data Parameterization should be an area of the automation framework.
- Test data ought to be unbroken distinct from the code and therefore the code ought to be reusable for various sets of computer file.
- Test results ought to be logged into a separate log file and will be fairly straightforward to grasp.

- Appropriate error handling method should be enclosed as a part of the automation framework. In addition, usage of recovery situations should be unbroken at minimal, as recovery situations consume extra interval and different resources.
 - The automation framework should be written in such the way that if one check script fails, Unified practical Testing (formerly QTP) mustn't stop the execution method. Ideally, the framework ought to report the errors and travel to execute future test suit.
- Automation Framework design

4.4 MINI PROJECT

Enquiry of Building Project

4.4.1 Case Study: Enquiry of Building Project

4.4.2 Problem Statement:

Fill and send the Enquiry form to the builder.

- Go to the Builders site
- Select the Contact Us to fill the details
- Find the villas that can be taken in to possession before December this year

Suggested site: <https://ishahomes.com>

4.4.3 Detailed Description:

- Once the builders home page is launched in the specified browser, navigate to the <contact us> in “More” menu.
- Enter the necessary text fields in the given form.
- Select the project from the field.
- Extract the number of available projects in the form and display in the console
- Display the selected project and submit the form
- Navigate to Buy Villas link
- Extract the Area and city of the Villa projects which has more than 10 Units
- Possession date should be on or before December month of current year
- Capture the Screenshot of the
- Close the Browser

4.4.4 Key Automation Scope:

- Execute in different Browsers
- Extract the number of projects available with the builder
- Display the selected project
- Filling form (in different objects in web page)

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 CONCLUSION

Cognizant learning program engages young skills like us with a comprehensive learning pathway, giving the millennials a chance to move with • Subject Matter specialists (SME) • Understand the company atmosphere and groom themselves Cognizant emphasizes on Learner Autonomy wherever students take hold of their own learning, with the on the market tools and resources. A lot of focus is on “learning” than “teaching”.

Technologies coated as a part of this Automation Testing with UFT and HC sides Learning Path are:

- Agile Fundamentals
- Unified Functional Testing
- SQL, XML & JSON
- VBScript Programming
- UFT Automation tool Performance

Objective was one Should be ready to make a case for software system Testing Life Cycles(STLC) Should be ready to demonstrate useful testing atmosphere setup, action style from requirement/scenarios, check knowledge setup, check execution, bug reportage and check closure Should be ready to illustrate VBscript programming, writing reusable strategies, breaking down issues into sub issues Should be ready to discover WebElement for page classes(Webpages) victimization object repository for UFT automation Should be ready to demonstrate produce Object Repository Files, establish automation check knowledge Sets, Maintain knowledge manipulation functions .

One Should analyse the appliance below check with the appliance professional and break it down into little, logical business elements Should be ready to interpret the entities and relationships and build easy tables in information, and write easy queries to retrieve knowledge from the information Should be ready to demonstrate XML/JSON file creation and parsing Should be ready to demonstrate Claims process system and sides summary and cluster, Subgroup and Class/Plan Configuration, Enrollment, Member & Eligibility, Medical & Hospital Claim process Should be ready to demonstrate claim creations.

5.2 FUTURE SCOPE

Acts as a platform to the company world Work on business aligned use cases Learn and Work with subject material specialists chance to act with Leaders a great geographic point thrives on concepts and chance. You'll realize each at cognizant. Follow your concepts, and select innovative career tracks. Challenge convention. You're able to lead and influence amendment. To create a distinction. Discover what we've got to supply, and what we are able to do along.

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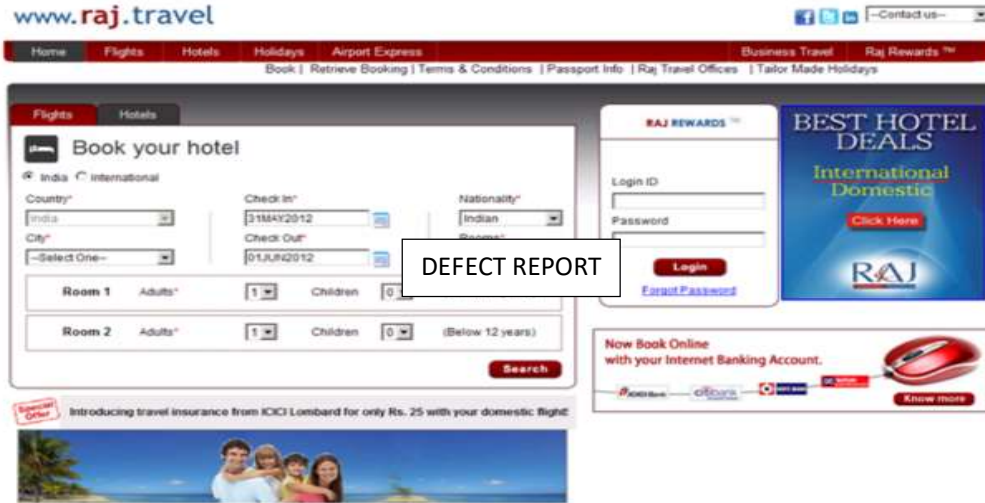
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APPLICATIONS OF SOFTWARE USED

1.FUNCTIONAL TESTING: Hotel Booking



TEST SCENARIOS

Scenario ID	Scenario Name	Scenario Description	Requirement id
TestScenario_01	Raj Travels & Hotel Booking - Valid Search	To check if the user is able to Search hotel by entering valid details	R1
TestScenario_02	Raj Travels & Hotel Booking - Invalid Search	To check if the user is able to Search hotel by entering invalid details	R1
TestScenario_03	Raj Travels & Hotel Booking - Alternate Search	To check if the user is able to Search hotel by providing partial details	R1
TestScenario_04	Raj Travels & Hotel Booking - Field Validation	Validating fields given by the user interface	R2

Test Case ID	Test Case Description	Test Data Parameters	Expected Results
TestScenario_3	To check if the user is able to search and getting an error message by Providing invalid mandatory details and leaving the non mandatory fields empty	The Booking website must be available Test Data Details : Location, City, Check In, Check Out, Nationality, Room, Adults and Children	START: Launch the Browser & Open Application STEP 1: Choose the invalid "Location" from drop down STEP 2: Choose the invalid "Country" from drop down STEP 3: Select invalid option from drop down "city" list STEP 4: Select invalid option from "Check in" drop down STEP 5: Select invalid option from "Check out" drop down STEP 6: Select invalid option from "nationality" drop down STEP 7: Select invalid option from "room" drop down STEP 8: Select invalid option from "adults" drop down STEP 9: Select invalid option from "children" drop down STEP 10: Click on "SEARCH" button
TestCase_13	To check if the user able to select choices from "Location" radio button	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from location radio button
TestCase_14	To check whether the user able to select choices from "country" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from country list box
TestCase_15	To check whether the user able to select choices from "city" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from city list box
TestCase_16	To check whether the user able to select choices from "check in" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from check in list box
TestCase_17	To check whether the user able to select choices from "check out" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from check out list box
TestCase_18	To check whether the user able to select choices from "check in" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from check in list box
TestCase_19	To check whether the user able to select choices from "check out" drop down menu	The website should be available Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)	Open the application Select valid option from check out list box

915929_HandsOn(1)HotelBooki... Excel (Product Activation Failed)

RTM

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View.

Serial no	Requirement id	Requirement description	Test scenario id	Test case id	Defect id
7	TestScenario_02/ TestCase_09	Defect_01	"check out date should be greater than check in date" message should be displayed	Yes	Medium
10		Actual Result: User is navigated to the next page			
14		The user is navigated to the next screen without displaying the correct details			
16		Expected Result: The application should display the correct required details in the next screen			
19	TestScenario_01/ TestCase_02	Defect_02	The application is not display the correct required details in the next screen	Yes	High
21		Actual Result: The application is not display the correct required details in the next screen			
22		Test Data Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)			
27		The user is Getting result for calcutta City as user enters Delhi .			
28		Expected Result: Delhi should be displayed in the city list box.			
30	TestScenario_01/ TestCase_01	Defect_03	Calcutta is displayed instead of Delhi.	Yes	High
32		Actual Result: Calcutta is displayed instead of Delhi.			
34		Test Details Parameters (Location, Country, City, Check In, Check Out, Nationality, Room, Adults, Children)			

Index TEST SCENARIO TEST CASES DEFECT REPORT RTM

915929_HandsOn(1)HotelBooking (1) [Protected View] - Excel (Product Activation Failed)

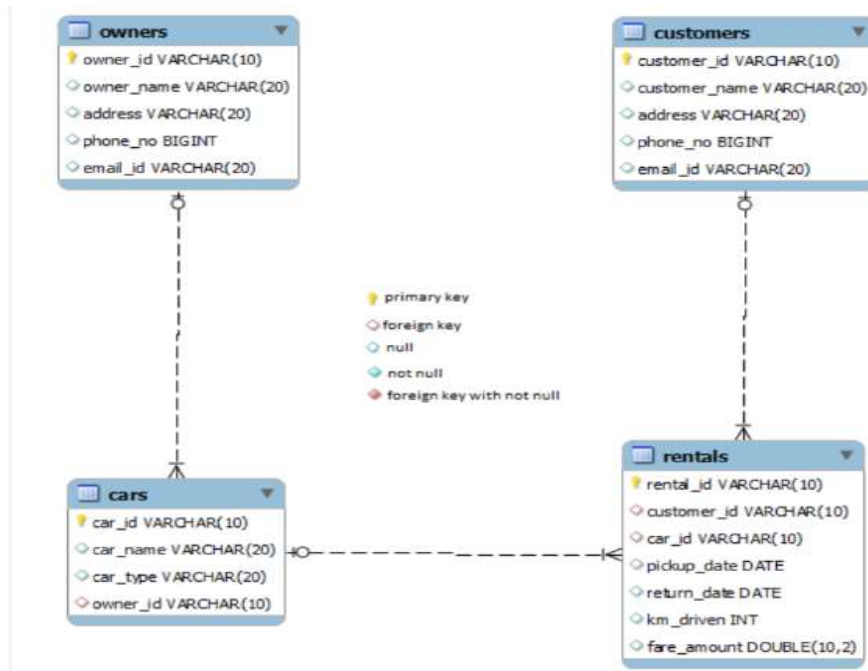
Enable Editing

Serial no	Requirement id	Requirement description	Test scenario id	Test case id	Defect id
2	R1	To check Whether the user is able to search hotel by providing details in the field	TestScenario_01	TestCase_01	Defect_03
3				TestCase_02	Defect_02
4				TestCase_03	
5				TestCase_04	
6				TestCase_05	
7				TestCase_06	
8	R2	To check Whether the user is able to search hotel by providing invalid details in the field	TestScenario_02	TestCase_07	
9				TestCase_08	
10				TestCase_09	Defect_01
11				TestCase_10	
12				TestCase_11	
13				TestCase_12	
14	R3	To check Whether the user is able to search hotel by providing Alternate details in the field	TestScenario_03	TestCase_13	
15				TestCase_14	
16				TestCase_15	
17				TestCase_16	
18				TestCase_17	
19	R4	To check whether is user is able to validate the fields	TestScenario_04	TestCase_18	
20				TestCase_19	
21				TestCase_20	
22				TestCase_21	
23				TestCase_22	
24				TestCase_23	

Index TEST SCENARIO TEST CASES DEFECT REPORT RTM

2.DATASOURCE: MARUTI CAR OWNER DETAILS

FLOWCHART



Query with OUTPUT

```
query.sql
1 select o.owner_id,o.owner_name,o.address,o.phone_no from owners o
2 inner join cars c on o.owner_id = c.owner_id where c.car_name
3 like '%Maruthi%' order by o.owner_id;
```

owner_id	owner_name	address	phone_no
01	Jeeva	Mumbai	9487256231
03	Balu	Chennai	9487267847

Note: Ensure to provide all your program's inputs at a single stretch before clicking "Compile and Run"
Eg: Program expects an input of ID, Name and Phone which displays all these data in the console as output, then the inputs must be given as

APPENDIX B

B.1 CODE TO RUN A QUERY

```
Dim objCon, objRecordSet, strExlFile, colCount, row, i
```

```
Set objCon = CreateObject("ADODB.Connection")
```

```
Set objRecordSet = CreateObject("ADODB.Recordset")
```

```
strExlFile = "C:\Users\Administrator\Desktop\name.xls"
```

```
objCon.Open "DRIVER={Microsoft Excel Driver (*.xls)};DBQ=" &strExlFile& ";Readonly=True"
```

```
strSQLStatement = "SELECT * FROM [Sheet1$]"
```

```
objRecordSet.OpenstrSQLStatement, objCon 'create recordset
```

```
colCount = objRecordSet.Fields.count 'No of columns in the table
```

```
    WORKER_ID INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
```

```
    FIRST_NAME CHAR(25),
```

```
    LAST_NAME CHAR(25),
```

```
    SALARY INT(15),
```

```
    JOINING_DATE DATETIME,
```

```
    DEPARTMENT CHAR(25)
```

```
);
```

```
INSERT INTO Worker
```

```
(WORKER_ID, FIRST_NAME, LAST_NAME, SALARY, JOINING_DATE, DEPARTMENT) VALUES
```

```
(001, 'Monika', 'Arora', 100000, '14-02-20 09.00.00', 'HR'),
```

```
(002, 'Niharika', 'Verma', 80000, '14-06-11 09.00.00', 'Admin'),
```

```
(003, 'Vishal', 'Singhal', 300000, '14-02-20 09.00.00', 'HR'),
```

```
(004, 'Amitabh', 'Singh', 500000, '14-02-20 09.00.00', 'Admin'),
```

```
(005, 'Vivek', 'Bhati', 500000, '14-06-11 09.00.00', 'Admin'),
```

```
(006, 'Vipul', 'Diwan', 200000, '14-06-11 09.00.00', 'Account'),  
(007, 'Satish', 'Kumar', 75000, '14-01-20 09.00.00', 'Account'),  
(008, 'Geetika', 'Chauhan', 90000, '14-04-11 09.00.00', 'Admin');
```

```
While objRecordSet.EOF=false
```

```
    row=""
```

```
    For i=0 to colCount-1
```

```
    row=row &" "&objRecordSet.fields(i)
```

```
    Next
```

```
    MsgBox row
```

```
objRecordSet.moveNext
```

```
Wend
```

```
Set objRecordSet = Nothing
```

```
objCon.Close
```

```
Set objCon = Nothing
```

```
END TO END TEXT:
```

```
systemUtil.run "iexplore.exe","https://www.bmw.in/en/"
```

```
Set Browsec = Description.Create
```

```
Browsec("micclass").Value="Browser"
```

```
Browsec("openurl").Value="https://www.bmw.in/en"
```

```
Set Pag = Description.Create
```

```
Pag("micclass").Value="Page"
```

```
Pag("url").Value="https://www.bmw.in/en"
```

```
Set Pagg = Description.Create
```

```
Pagg("micclass").Value="Page"
```

```
Pagg("url").Value="https://www.bmw.in/en/all-models/7-series/sedan/2019/bmw-7-series-sedan-inspire.html"
```

```
Set Pag2 = Description.Create
```

```
Pag2("micclass").Value="Page"
```

```
Pag2("url").Value="https://www.bmw.in/en/all-models/7-series/sedan/2019/bmw-7-series-sedan-technical-data.html"
```

```
Set Model = Description.Create
```

```
Model("micclass").Value="Link"
```

```
Model("innertext").Value="Models"
```

```
Set Series = Description.Create
```

```
Series("micclass").Value="WebButton"
```

```
Series("innertext").Value="7"
```

```
Set Img = Description.Create
```

```
Img("micclass").Value="Image"
```

```
Img("alt").Value="BMW 7 Series Sedan"
```

```
Set Listt = Description.Create
Listt("micclass").Value="WebList"
Listt("outertext").Value="Inspire Inform Technical Data"
Listt("select type").Value="ComboBox Select"
```

```
Set Tech = Description.Create
Tech("micclass").Value="Link"
Tech("class").Value="ds2-font-button ds2-tracking-js--event"
Tech("href").Value="https://www.bmw.in/en/all-models/7-series/sedan/2019/bmw-7-series-sedan-technical-data.html"
Tech("abs_x").Value="454"
Tech("y").Value="4"
```

```
Set TopSpeed = Description.Create
TopSpeed("micclass").Value="WebElement"
TopSpeed("innertext").Value="250"
```

```
Set Bro = Description.Create
Bro("micclass").Value="Browser"
Bro("title").Value="BMW 7 Series : The Sedan of the luxury class | BMW.in"
```

```
Browser(Browsec).Page(Pag).Link(Model).Click
Browser(Browsec).Page(Pag).WebButton(Series).Click
Browser(Browsec).Page(Pag).Image(Img).Click
Browser(Browsec).Page(Pag).WebList(Listt).Link(Tech).Click
speed = Browser(Browsec).Page(Pag2).WebElement(TopSpeed).GetROProperty("innertext")
Msgbox "Top speed in km/h: " & speed
```

```
Set tExcel = CreateObject("Excel.Application")
tExcel.Visible=False
tExcel.workbooks.add
```

```

tExcel.sheets.add
tExcel.Cells(1,1).Value="Speed"
tExcel.Cells(2,1).Value=speed
tExcel.ActiveWorkbook.SaveAs "C:\Users\Administrator\Desktop\speed.xls"
tExcel.workbooks.close

```

```

If (speed<500) Then
    MsgBox "Does not meet my requirements"
Else
    MsgBox "Requirement meet: True"
End If

```

B.2 : XML CODE

```

<?xml version="1.0"?>
<Environment><Variable><Name>Address</Name><Value><![CDATA[
Hamirpur, H.P.
]]></Value></Variable><Variable><Name>Age</Name><Value><![CDATA[
21
]]></Value></Variable><Variable><Name>EmpId</Name><Value><![CDATA[
916387
]]></Value></Variable><Variable><Name>Test_Environment</Name><Value><![CDATA[
[Window !0 Operating System
]]></Value></Variable><Variable><Name>Tester_Name</Name><Value><![CDATA[
]]></Value></Variable></Environment>

```

APPENDIX C

C.1 Handle ArrarOutOfIndex

'Anushka Dixit (915929)

Option Explicit

Dim arr ,i

arr = Array("a","b","c","d","e")

for each i in arr

msgbox i

Next

On Error Resume Next

MsgBoxarr(5)="f"

Err.Raise 101

MsgBox "Error "&err.number

err.clear

msgbox "Error " &Err.Number

MsgBox" END... "

APPENDIX D

D.1 CODE TO IMPLEMENT END TO END AUTOMATION

915929-ANUSHKA DIXIT

```
SYSTEMUTIL.RUN "IEXPLORE.EXE","HTTPS://WWW.BMW.IN/EN/"
```

```
SET BROWSEC = DESCRIPTION.CREATE
```

```
BROWSEC("MICCLASS").VALUE="BROWSER"
```

```
BROWSEC("OPENURL").VALUE="HTTPS://WWW.BMW.IN/EN"
```

```
SET PAG = DESCRIPTION.CREATE
```

```
PAG("MICCLASS").VALUE="PAGE"
```

```
PAG("URL").VALUE="HTTPS://WWW.BMW.IN/EN"
```

```
SET PAGG = DESCRIPTION.CREATE
```

```
PAGG("MICCLASS").VALUE="PAGE"
```

```
PAGG("URL").VALUE="HTTPS://WWW.BMW.IN/EN/ALL-MODELS/7-SERIES/SEDAN/2019/BMW-7-SERIES-SEDAN-INSPIRE.HTML"
```

```
SET PAG2 = DESCRIPTION.CREATE
```

```
PAG2("MICCLASS").VALUE="PAGE"
```

```
PAG2("URL").VALUE="HTTPS://WWW.BMW.IN/EN/ALL-MODELS/7-SERIES/SEDAN/2019/BMW-7-SERIES-SEDAN-TECHNICAL-DATA.HTML"
```

```
SET MODEL = DESCRIPTION.CREATE
```

MODEL("MICCLASS").VALUE="LINK"

MODEL("INNERTEXT").VALUE="MODELS"

SET SERIES = DESCRIPTION.CREATE

SERIES("MICCLASS").VALUE="WEBBUTTON"

SERIES("INNERTEXT").VALUE="7"

SET IMG = DESCRIPTION.CREATE

IMG("MICCLASS").VALUE="IMAGE"

IMG("ALT").VALUE="BMW 7 SERIES SEDAN"

SET LISTT = DESCRIPTION.CREATE

LISTT("MICCLASS").VALUE="WEBLIST"

LISTT("OUTERTEXT").VALUE="INSPIRE INFORM TECHNICAL DATA"

LISTT("SELECT TYPE").VALUE="COMBOBOX SELECT"

SET TECH = DESCRIPTION.CREATE

TECH("MICCLASS").VALUE="LINK"

TECH("CLASS").VALUE="DS2-FONT-BUTTON DS2-TRACKING-JS--EVENT"

TECH("HREF").VALUE="HTTPS://WWW.BMW.IN/EN/ALL-MODELS/7-SERIES/SEDAN/2019/BMW-7-SERIES-SEDAN-TECHNICAL-DATA.HTML"

TECH("ABS_X").VALUE="454"

SET TOPSPEED = DESCRIPTION.CREATE

TOPSPEED("MICCLASS").VALUE="WEBELEMENT"

TOPSPEED("INNERTEXT").VALUE="250"

SET BRO = DESCRIPTION.CREATE

BRO("MICCLASS").VALUE="BROWSER"

BRO("TITLE").VALUE="BMW 7 SERIES : THE SEDAN OF THE LUXURY CLASS | BMW.IN"

BROWSER(BROWSEC).PAGE(PAG).LINK(MODEL).CLICK

BROWSER(BROWSEC).PAGE(PAG).WEBBUTTON(SERIES).CLICK

BROWSER(BROWSEC).PAGE(PAG).IMAGE(IMG).CLICK

BROWSER(BROWSEC).PAGE(PAGG).WEBLIST(LISTT).LINK(TECH).CLICK

SPEED =

BROWSER(BROWSEC).PAGE(PAG2).WEBELEMENT(TOPSPEED).GETROPROPERTY("INNERTEXT")

MSGBOX "TOP SPEED IN KM/H: " &SPEED

SET TEXCEL = CREATEOBJECT("EXCEL.APPLICATION")

TEXCEL.VISIBLE=FALSE

TEXCEL.WORKBOOKS.ADD

TEXCEL.SHEETS.ADD

TEXCEL.CELLS(1,1).VALUE="SPEED"

TEXCEL.CELLS(2,1).VALUE=SPEED

TEXCEL.ACTIVEMWORKBOOK.SAVEAS "C:\USERS\ADMINISTRATOR\DESKTOP\SPEED.XLS"

TEXCEL.WORKBOOKS.CLOSE

IF (SPEED<500) THEN

MSGBOX "DOES NOT MEET MY REQUIREMENTS"

ELSE

MSGBOX "REQUIREMENT MEET: TRUE"

END IF

D.2 CODE FOR MINI PROJECT

SystemUtil.Run"iexplore.exe","http://www.redbus.in"

Browser("Book Bus Travels, AC Volvo").Page("Book Bus Travels, AC Volvo").WebEdit("WebEdit").Set DataTable("CityFrom", dtGlobalSheet)

Browser("Book Bus Travels, AC Volvo").Page("Book Bus Travels, AC Volvo").WebEdit("WebEdit_2").Set DataTable("CityTo", dtGlobalSheet)

Browser("Book Bus Travels, AC Volvo").Page("Book Bus Travels, AC Volvo").WebElement("Date").Click

Browser("Book Bus Travels, AC Volvo").Page("Book Bus Travels, AC Volvo").WebElement("12").Click

Browser("Book Bus Travels, AC Volvo").Page("Book Bus Travels, AC Volvo").WebButton("Search Buses").Click

Browser("Book Bus Travels, AC Volvo").Page("Delhi to Noida Bus Tickets").Sync

Browser("Book Bus Travels, AC Volvo").CloseAllTabs

