

OFFICIAL MICROSOFT LEARNING PRODUCT

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Software Testing with Visual Studio® 2013

Companion Content

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Module 1

Introduction to Application Lifecycle Management

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Lesson 1

Software Testing in an Agile World

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Agile Software Development

 **Additional Reading:** The concept of agile software development was first documented in Agile Manifesto in 2001. You can read more about the values and principles at <http://go.microsoft.com/fwlink/?LinkID=386346>.

Introduction to Scrum

 **Additional Reading:** Scrum is a set of rules, as defined in the Scrum Guide published by Scrum.org. To download the Scrum Guide in one of 30+ languages, visit <http://go.microsoft.com/fwlink/?LinkID=386347>.

Lesson 2

Application Lifecycle Management

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Visual Studio ALM Tools



Additional Reading: For more information on the differences between the various editions of Visual Studio, visit <http://go.microsoft.com/fwlink/?LinkID=386349>.

Lesson 3

Visual Studio Online

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What Is Visual Studio Online?

 **Additional Reading:** Visual Studio Online accounts are free for teams of up to five users. In addition, there is a free trial period to sign up and evaluate all the features of the service. Visit <http://go.microsoft.com/fwlink/?LinkID=386353> for more information and to sign up.

Lesson 4

Team Projects

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The Team Project



Additional Reading: For more information on planning your team project, visit the Team Foundation Server Planning Guide project on CodePlex (<http://go.microsoft.com/fwlink/?LinkID=386354>). Although the content is primarily targeted at the on-premises Team Foundation Server, the ALM Rangers do a good job of providing guidance that applies to Visual Studio Online as well.



Best Practice: Regardless of the template you select, do not change your process to fit the process template. However, you can change the process if it is broken or needs some structure.

Lesson 5

The Fabrikam Fiber Case Study

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Demonstration: Navigating CodePlex

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Demonstration: Navigating CodePlex

Demonstration Steps

1. In Internet Explorer, in the address bar, type **http://www.codeplex.com** and then press Enter.
2. In the search box at the top, type **Fabrikam Fiber**, and then press Enter.
3. Click the **Fabrikam Fiber** project in the list of search results.
4. Review the information on the home page of the project.
5. On the **Source Code** tab, click **History**, and then notice the date of the last commit.
6. Click the **Downloads** tab and notice the recommended (most recent) download.
7. Click the **Documentation** tab, and then review the information.
8. Click the **Discussions** tab, and then review the information.
9. Click the **Issues** tab, and then review the information.
10. Click the **People** tab, and then notice the list of recent project followers.
11. Click the **License** tab, and then notice the type of open source license this project uses.

Module Review and Takeaways

Best Practice

Testers are part of the development team, and they should collaborate with the developers during the sprint. The goal of the tester is not to find bugs, but rather to help develop high-quality software that delivers value to the customer. To achieve this goal, testing activities should begin as soon as possible and not wait until the developers complete development.

Best Practice

Successful agile software development teams maintain and abide by a DoD. The team creates and maintains the definition and that definition is understood by everyone involved with the effort. This definition impacts everything the team does including their estimates. The more the items on the list, the longer it takes to develop the software.

Best Practice

Smaller teams or teams that are just getting started with ALM should consider using Visual Studio Online.

Review Question(s)

Question: Why are agile software development teams more successful at delivering working software than traditional plan-driven waterfall teams?

Answer: Agile software development teams value working software over traditional process deliverables. The teams understand that collaborating, having conversations, and responding to changes is more important than creating detailed specifications and following a plan and a process. The result is an earlier realization of value in the software.

Lab Review Questions and Answers

Lab: Configuring the Learning Environment

Question and Answers

Question: Which email address domains are valid Microsoft accounts?

Answer: Hotmail.com, Live.com, Outlook.com, and any other company email address domains are valid Microsoft accounts.

Question: What are some of the advantages of using Visual Studio Online?

Answer: There are several advantages, including:

- Instantaneous setup
- No infrastructure to manage
- Data is secure and backed up
- Access to the service from anywhere by your team
- Integration with Visual Studio and other platforms

Question: Which identity provider is supported by Visual Studio Online?

Answer: Microsoft account, formerly known as Windows Live ID, is supported by Visual Studio Online.

Question: Why is it important to plan the name of your team project before creating it?

Answer: It is important to plan the name of your team project before creating it because team projects cannot be renamed.

Question: Can you download projects from CodePlex anonymously?

Answer: Yes, you can download projects from CodePlex anonymously. However, you need to authenticate to interact with the projects, ask questions, provide feedback, or contribute in some other way.

Module 2

Planning and Tracking Work

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Lesson 1

Writing Agile Requirements

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Requirements vs. Specifications



Best Practice: Do not create detailed requirements too soon. The product owner may only need a title and a short description for the requirement to discuss it with other stakeholders and determine its value. If the product owner decides *not* to invest in the development of the requirement, not much of effort will be lost. However, if detailed requirements, especially specifications are created, many efforts are wasted. Therefore, it is recommended that only after the product owner gives the permission to proceed on a requirement, you have additional conversations to evolve the requirement.

Lesson 2

Capturing Agile Requirements

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A Product Backlog

 **Additional Reading:** In Visual Studio Online, work items can be arranged in a hierarchy. A large PBI can be associated with one or more smaller PBIs to demonstrate decomposition. Visual Studio Online has a work item type called *Feature*. A product owner can use features to create a portfolio backlog, where features break down into PBIs. For more information on working with a portfolio backlog, visit this link: <http://go.microsoft.com/fwlink/?LinkID=386358>.

Lesson 3

Planning a Sprint

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A Task Work Item



Best Practice: Testing tasks should be created alongside any designing, development, documentation, and deployment tasks. Not only will this give a holistic view of the estimated work remaining, but it will also help foster the feeling that testers are a part of the team.



Best Practice: A team should avoid creating tasks, tests, or codes before the sprint is developed, where they would have forecasted the development. In other words, the team should not create tasks or test case work items for PBIs that they might not forecast for a few sprints. Conditions can change rapidly, forcing a change to the PBI or its acceptance criteria. Time is often wasted in creating these kinds of artifacts before they are even needed. The plan on how to develop a PBI, any code, or tests, just like the requirements, should be created at the latest responsible moment. On the other hand, avoid falling into the trap of doing things at the last possible moment.

Module Review and Takeaways

Best Practice

Bugs are part of the product backlog. It's important for the product owner, development team, and all stakeholders to see a single list of everything the product must do, but currently doesn't. Refining the product backlog and keeping it in good shape can be a full time job.

Lab Review Questions and Answers

Lab: Planning the Development Effort

Question and Answers

Question: What two work item types are displayed in the product backlog?

Answer: Product backlog item and bug work item types.

Question: What is the difference between business value and effort?

Answer: Business value is the measure of increase of value to the business when this feature (or bug fix) gets developed. Effort is a relative estimation of what it will take, in terms of size, effort, or complexity, for the development team to develop the feature (or bug fix). In other words, the effort is the *cost* and the business value is the *return*.

Question: What must a team have before they can use the forecast tool in Visual Studio Online?

Answer: An ordered, estimated product backlog and known velocity.

Question: What does the sprint backlog contain?

Answer: The forecasted PBI and bug work items and the plan (associated task work items) for developing them.

Module 3

Planning the Testing Effort

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Lesson 1

Knowing What to Test

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Types of Tests

 **Additional Reading:** Consider using Microsoft Fakes as a framework for isolating the code being tested. This framework simplifies development testing by replacing components of the application with stubs or shims. Microsoft Fakes comes with Visual Studio Ultimate or Premium edition. For more information, visit <http://go.microsoft.com/fwlink/?LinkID=386360>.

Acceptance Tests

 **Additional Reading:** SpecFlow is another acceptance testing framework that is popular with .NET developers. SpecFlow is a behavior-driven software development tool that binds business readable specifications to the underlying application. The tests live and run in Visual Studio and are implemented as any of the supported unit testing platforms—NUnit, xUnit, and MS-Test. To learn more, visit <http://go.microsoft.com/fwlink/?LinkID=386359>.

Lesson 2

Microsoft Test Manager

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What Is Microsoft Test Manager?



Additional Reading: Lab Center is used to define virtual or standard environments to be used in the build, deploy, and test scenarios. Lab Center and related lab management discussions are beyond the scope of this course. For more information on testing in a lab environment, visit <http://go.microsoft.com/fwlink/?LinkID=386361>.

Lesson 3

Organizing the Testing Effort

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Demonstration: Creating a Test Plan and Test Suites

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Demonstration: Creating a Test Plan and Test Suites

Demonstration Steps

1. Start Microsoft Test Manager.
2. Enter your team's Visual Studio Online account URL and then click **Add**.
3. If prompted, sign in with your Microsoft account and password
4. Expand the tree, and then select the **Fabrikam** team project.
5. Click **Connect now**.
6. Click the **Add** button.
7. Name the plan **Demonstration**.
8. Set the Iteration to **Fabrikam\Release 1\Sprint 1**.
9. Click **Add**.
10. Select the **Demonstration** plan.
11. Click **Select plan**.
12. Maximize the Microsoft Test Manager window.
13. At the upper-left side of the screen, click the **Properties** view.
14. Review the name, description, area path, iteration, owner, state, start and end dates, and other settings.
15. On the **Contents** view of the test plan, click **Add requirements**.
16. Review the query expression, and then click **Run**.
17. In the query results, select a PBI, and then click **Add requirements to plan**.
18. Right-click the requirement-based test suite, and then select **Open requirement**.
19. Review the information, and then close the work item window.
20. In the **Contents** view, right-click the **Demonstration (root)** test suite, and then click **New suite**.
21. Name the suite **Regression**.
22. On the right side of the view, from the **State** drop-down list, click **In planning**.
23. On the **Contents** view, right-click the **Demonstration (root)** test suite, and then click **New query-based suite**.
24. Name the suite **UI Tests**.
25. Add a new clause for the **Iteration Path** field to be **Under** the value **Fabrikam\Release 1\Sprint 1**.
26. Add a new clause for the **Title** field that **Contains** the value **ui**.
27. Click **Create test suite**.

Lesson 4

The Test Case

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Demonstration: Creating a Manual Test

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Demonstration: Creating a Manual Test

Demonstration Steps

1. Return to Microsoft Test Manager.
2. Ensure that you are on the **Contents** view.
3. Right-click on the **Demonstration** (root) test suite, and then select **New test case**.
4. Enter a title **Calculator can add two integers**.
5. Enter the following six steps:
 - **Run Calculator**
 - **Press 2**
 - **Press +**
 - **Press 2**
 - **Press =**
 - **Exit Calculator**
6. Add **4 is displayed** to the Expected Result of the "Press =" step:
7. Click **Save and Close**.

Module Review and Takeaways

Best Practice

Manual tests are important and sometimes the only way to verify complex behaviors. However, high-performance agile software development teams strive for automation. Some will even challenge themselves to convert any manual tests to automated tests before the end of the sprint. They do this by adding it to their DoD. You will learn more about automation in the upcoming modules.

Lab Review Questions and Answers

Lab: Planning the Testing Effort

Question and Answers

Lab Review

Question: What are the three types of test suites?

Answer:

Static, query-based, and requirements-based are the three types of test suites.

Question:

What is the name of the default (root) test suite in a new test plan?

Answer:

The name of the default (root) test suite in a new test plan is the same as that of the test plan.

Question: What kind of test suite would you use to dynamically show all test cases that match specific criteria?

Answer: A query-based test suite.

Question: Yes. The steps can be specified later, or the test case title or summary can provide enough information to the tester.

Answer: Yes. The steps can be specified later, or the test case title or summary can provide enough information to the tester.

Module 4

Running Manual Tests

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Lesson 1

Knowing Where and When to Test

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UI Testing Tips and Tricks



Best Practice: The best practice for reducing waste when performing UI testing is to have strong collaboration between the developer and tester groups. If the two groups talk regularly throughout the sprint, they will know the best time to begin testing, which minimizes waste in both the code and the tests.

Lesson 2

Running a Manual Test

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Demonstration: Running a Manual Test

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Demonstration: Running a Manual Test

Demonstration Steps

1. In Microsoft Test Manager, at the top of the screen, click the **Test** hub.
2. On the left side of the screen, select a test suite in the tree.



Note: Each test suite lists the number of test cases it contains in parentheses.

3. On the right side of the screen, right-click a test case, and then click **Run**.
4. Click **Start Test**.
5. Click the arrow to the right of the first test step, and then click **Pass**.
6. Click the arrow to the right of the second test step, and then click **Fail**.
7. Enter the comment **A critical error occurred**.
8. Click the **Pause** button on the Test Runner toolbar.
9. On the pop-up window, click **Resume**.
10. At the very top of Test Runner, click the **Return to the Testing Center** button.
11. At the upper-right corner of Microsoft Test Manager, click **Return to Test Runner**.
12. On the pop-up window, click **Resume**.
13. Click the **Edit** link above the Test Runner toolbar.
14. Review the test case work item.
15. Click the **End test** link below the last test step.
16. At the top of Test Runner, click **Save and Close**.

Lesson 3

Recording and Playing Back

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Recording Actions



Best Practice: You might not want to record some screen elements, such as passwords, email addresses, Skype conversations, and other sensitive data. Because all keystrokes, mouse clicks, and other gestures are recorded, it is important to pause a test to disable the recording of these items.

Fast-Forwarding a Recorded Test



Best Practice: When playing back a recorded test, it is best to *not* select the **Overwrite** option when you start the test. It does not make sense to record new actions that are a direct result of the current actions being executed automatically.



Additional Reading: High performance testers are ones who have mastered the keyboard shortcuts in Microsoft Test Manager and Test Runner. For a list of keyboard shortcuts, visit <http://go.microsoft.com/fwlink/?LinkID=389888>.

Supported Configurations and Platforms



Additional Reading: For a comprehensive and updated list of the configurations and platforms that support action recordings, visit <http://go.microsoft.com/fwlink/?LinkID=389889>.



Additional Reading: Teams that are developing their own controls should ensure that the controls are testable by Microsoft Test Manager. This capability can be added incrementally so that initially a control simply supports record and playback via Microsoft Test Manager. Later, the control can be refactored so that coded UI tests can access the control's individual properties to assert behavior automatically. For more information on how to enable UI testing of controls, visit <http://go.microsoft.com/fwlink/?LinkID=389890>.

Lesson 4

Collecting Data

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Capturing Data Automatically During Testing

 **Additional Reading:** You can also collect data and diagnostic information from additional computers that are participating in a test lab environment. Testing on more than a single computer running Microsoft Test Manager is beyond the scope of this class. For more information, visit

<http://go.microsoft.com/fwlink/?LinkID=389891>.

 **Best Practice:** The default test settings in a Visual Studio Scrum team project are named *Local Test Run*. Instead of opening Local Test Run and changing its values, you should create new test settings, with a meaningful name, such as IntelliTrace, Action Recording only, Desktop Video, and so on,, and then select the appropriate data and diagnostic settings. Any test settings that are created are available to other test plans that the team might create.

 **Best Practice:** If you are unsure what the default test settings are for a test plan, run the test with options to double check the test settings. If no changes to the defaults are necessary, you can click **Run**.

 **Additional Reading:** If you run many tests with the data diagnostic adapters enabled, a lot of data will be generated. This generated data is stored in Visual Studio Online. If you manually add captured data to this data, your team project size will increase. Storing rich diagnostic data will take up a lot of database space. Even though a team is using Visual Studio Online, it should consider using the Visual Studio Team Foundation Server 2013 Power Tools to remove unwanted test attachments. Visit <http://go.microsoft.com/fwlink/?LinkID=389892> for more information.

Demonstration: Capturing Data During Testing

Demonstration Steps

1. In Microsoft Test Manager, at the top of the screen, click the **Test** hub.
2. On the right side of the screen, right-click a test case, and then click **Run**.
3. Click **Start Test**.
4. In Test Runner, right-click the second test step, and then click **Comment**.
5. Type **We should change the UI because it is very old and outdated**, and then click **Save** the comment.
6. On the Test Runner toolbar, click the screenshot drop-down list, and then click **Capture rectangular screenshot**.
7. Using the pointer, draw a rectangular box around the top area of the Test Runner window.
8. Click the drop-down control to the right of the second test step, and then select **Pass**.
9. Select the third test step.
10. On the Test Runner toolbar, click the attachment (paper clip) button.
11. Go to **C:\Windows\Web**, and then select any image file that is in one of the subfolders.
12. In Test Runner, right-click the test step, and then click **Comment**.
13. Type **How about something that matches this theme?**, and then click **Save**.
14. Click the **End test** link below the last test step.
15. At the top of Test Runner, click **Save and Close**.

16. At the top of the screen, click the **Plan** hub.
17. Click **Properties** to go to the test plan properties page
18. In the **Test settings** drop-down for manual runs, click **New**.
19. Name the settings **Video**.
20. Add the description **Desktop video and system information**.
21. Click **Next** twice.
22. Select the **Action Log, Screen and Voice Recorder**, and **System Information** diagnostic data adapters.
23. Click **Finish**.
24. Ensure that the **Video** test settings is selected for manual runs.
25. On the upper-right corner of the test plan properties page, click **Save and Close**.
26. At the top of the screen, click the **Test** hub.
27. On the left side of the screen, select the same test suite in the tree as you did earlier in this demonstration.
28. On the right side of the screen, right-click the same test as you did earlier in this demonstration, and then click **Run with options**.
29. Select **Video** from the **Test settings** drop-down list.
30. Click **Run**.
31. Start Internet Explorer.
32. In Test Runner, click **Start Test**.
33. Perform each step's and then mark each step as **Pass** after you finish the step.
34. For each test step, follow the instructions.
35. Click the **End test** link below the last test step.
36. At the top of Test Runner, from the test result attachment (paper clip) drop-down list, select the **SystemInformation.xml** file, and then review its contents.
37. Close Internet Explorer.
38. Notice the .wmv video recording file with the prefix *ScreenCapture*.



Note: Running the video might require additional configuration steps.

39. At the top of Test Runner, click **Save and Close**.

Lesson 5

Viewing and Analyzing Test Results

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Analyzing Test Runs

 **Additional Reading:** For more information on changing and filtering columns in Microsoft Test Manager, visit <http://go.microsoft.com/fwlink/?LinkID=389893>.

Viewing Test Plan Results

 **Best Practice:** Click the **Refresh** button when you first view the Test Results or any other screen that lists or aggregates test results. Refresh the screen often, especially when other team members are actively contributing to the testing effort.

 **Additional Reading:** Although Visual Studio Online does not support reports, for teams using an on-premises Team Foundation Server, there is a relevant report in the Visual Studio Scrum process template. The Test Plan Progress report shows how much testing the team has completed as well as how likely the team is to finish testing on time. The report also shows the number of tests to be run and the tests that are currently passing, failing, and blocked. For more information, visit <http://go.microsoft.com/fwlink/?LinkID=389894>.

Tracking Bugs Created During Testing

 **Best Practice:** Fix bugs. Do not track them.

Module Review and Takeaways

Best Practice

Testers, like the end users of software, might have a tendency to capture too much data. It is very appealing to enable more adapters than are required to accomplish the testing. Not only does this slow down the testing experience, but it also generates a lot of bloat on the back end because all the test attachments grow in size.

Lab Review Questions and Answers

Lab: Running Manual Tests

Question and Answers

Question: Why might a tester want to click the pause button while running a test?

Answer: A tester might pause a test and jump over to another application or type some sensitive information without recording it.

Question: What makes a manual test fail?

Answer: A tester can make a manual test to fail. However, Test Runner will automatically fail the test if any of the test step results fail or if any test steps with expected results are skipped.

Question: Besides the outcome state, what other types of information can you collect during testing?

Answer: There are several data and diagnostic type information that a tester can collect during testing. A tester can manually add comments, screenshots, file attachments, and associated bug work items. In addition, a tester can configure the automatic collection of action logs, action recordings, IntelliTrace information, code coverage information, event log information, screen and voice recordings, system information, and test impact data.

Module 5

Testing in the Real World

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Lesson 1

Using Parameters and Shared Steps

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Using Parameters



Best Practice: Because testing many sets of data can be tedious and prone to errors, you should create an action recording, if possible. While recording actions, run the test by using the first set of parameter values, and then play it back for the other sets of data. You can also change the parameter values in between two test runs, without breaking the action recording.

Using Shared Steps



Best Practice: Be careful when editing shared steps. The changes you make to the shared steps appear in every test case that uses them. Before making any big change, go to the Links tab of the shared steps work item and see the impact of the changes on the various test cases in your team project.

Lesson 2

Testing on Different Configurations

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Creating and Managing Configurations



Best Practice: The whole team including the product owner should decide what variables and variable values to create and what configurations are possible.

Testing on Multiple Configurations



Best Practice: Do not use configurations in place of parameters. If your goal is to run a test with a different set of input data, it is easy to define parameters and provide that data ahead of time. Use test configurations to define variations in the hardware or software platform on which the application under test (AUT) is installed and tested.

Lesson 4

Exploratory Testing

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Introduction to Exploratory Testing



Best Practice: Testers on agile software development teams should always question if a particular test case has a high chance of becoming irrelevant. If the answer is yes, then they should think about why they need to create it in the first place. Tests that require a high degree of maintenance take value away from other work that the team could be doing. In such situations, the teams should consider exploratory testing as an alternative.

Performing Exploratory Testing



Best Practice: When the coding of a requirement is checked in, it is a good practice to build and run the tests that focus on that requirement. The team can decide to link any bug work items that get created to the original requirement to demonstrate that it is not yet complete.

Module Review and Takeaways

Best Practice

Exploratory testing is more than just using an application instead of a test script. It is a practice that requires you to continuously think, evaluate, and manage your own time. As an exploratory tester, you can and should do a combination of learning, designing, executing, and interpreting at any given time.

Lab Review Questions and Answers

Lab: Testing in the Real World

Question and Answers

Question: What are the benefits of parameters?

Answer: The main benefit of parameters is that they enable you to run the same test case multiple times with different data. This enables you to test a greater variety of input data. You can also use parameters to change input data without recreating an action recording.

Question: Can shared steps have parameters?

Answer: Yes. The parameters are set in the test case that uses the shared steps.

Question: What is a test point?

Answer: A test point is the combination of a test case and a specific configuration. For example, if you want to run test case A on configuration B and configuration C, then there would be two test points: AB and AC.

Question: Why would a tester want to use Team Web Access to create a test case?

Answer: Team Web Access provides a lightweight, web-based interface for creating and running manual test cases. Team Web Access does not require a tester to install any software other than the browser. By using the web-based tool, you can also paste multiple test cases, each containing multiple steps, actions and, expected results, from Excel.

Question: Does a tester need to select a specific requirement before performing exploratory testing?

Answer: No. A tester can perform exploratory testing without selecting a requirement, such as a Product Backlog Item (PBI) or a bug work item. This enables the tester to perform exploratory testing without focusing on any particular requirement. Associating an exploratory test with a requirement will associate the recording of the test with the work item.

Module 6

Improving Testing Practices

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Lesson 1

Automating Test Cases

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The Importance of Automated Testing

 **Additional Reading:** The Visual Studio 2013 Ultimate edition offers web performance and load testing tools that you can use to simulate thousands of simultaneous virtual users. These types of automated tests help solve problems of scalability, availability, and capacity planning. For more information, visit <http://go.microsoft.com/fwlink/?LinkId=390624>.

 **Best Practice:** Manual testing, which includes exploratory testing, executed by experienced and professional software testers should always be a part of a test plan. At the same time, you should also create enough automated tests that verify a majority of the application behavior. This will give the testers more time to run the current, high-valued, and exploratory tests.

Automated Testing in Visual Studio

 **Additional Reading:** For more information on the various types of automated tests available in Visual Studio, visit the MSDN article at <http://go.microsoft.com/fwlink/?LinkId=390627>.

Coded UI Tests

 **Additional Reading:** You cannot automate all configurations, platforms, and UI controls. For more information on supported configurations and platforms for coded UI tests and action recordings, visit the following link: <http://go.microsoft.com/fwlink/?LinkId=390628>.

 **Additional Reading:** For more information on how to verify the behavior of an application by using UI automation and coded UI tests, see the MSDN article at <http://go.microsoft.com/fwlink/?LinkId=390629>. For best practices for creating flexible coded UI tests, see the MSDN article at <http://go.microsoft.com/fwlink/?LinkId=390630>.

Automating a Test Case

 **Best Practice:** When you are converting a manual test case to an automated test, set the automation status and other fields, instead of creating a new work item. You can leave the first test case for manual testing, and then create a second test case for automation. However, this will generate extra test cases to manage. In future, if you decide to remove the automation, the test case will revert to the manual test case because the test steps will still be there.

 **Additional Reading:** If you want to associate multiple automated tests with test cases, then you should consider using the tcm.exe command line utility. You can use the utility to import all test methods from a Visual Studio solution into test cases. For more information, visit the following link: <http://go.microsoft.com/fwlink/?LinkId=390631>.

 **Additional Reading:** For more information on determining the development done since a previous build, visit the following link: <http://go.microsoft.com/fwlink/?LinkID=389905>. For more information on determining the tests that should be run since a previous build, visit the following link: <http://go.microsoft.com/fwlink/?LinkID=389906>.



Additional Reading: Visual Studio Online does not support creating or hosting of lab environments. For teams that want to take advantage of this capability, they should set up and configure their own lab environment locally by installing a test controller and deploying test agents to one or more physical or virtual computers. For more information, visit the following link:

<http://go.microsoft.com/fwlink/?LinkID=389907>.

Lesson 2

Promoting Test Cases

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Regression Testing



Best Practice: Because the workload will continue to increase from one sprint to another, regression testing is best performed by using automated tests. In addition, only those regression tests that cover the areas impacted by the recent changes should be run. The tools in Microsoft Test Manager and Visual Studio support these best practices.

Preparing for the Next Sprint



Best Practice: For teams or organizations operating under governance and compliance, making true (deep) copies of test cases is a best practice. Although Visual Studio Online provides a level of auditing by tracking changes made to individual test case work items, to maximize auditability, these teams should still create true copies as they move from test plan to test plan. This can be a time-consuming task.



Additional Reading: For more information on the tools and practices to manage test plans, test cases, and shared steps when moving to the next sprint, refer to the book, "Test Release Management Guidance". It is written by Visual Studio ALM Rangers and you can find it at the following site:

<http://go.microsoft.com/fwlink/?LinkID=389909>.

Module Review and Takeaways

Best Practice

Nobel prize winner Dutch physicist Hendrik Lorentz had a theory that nobody can reach the speed of light because its mass becomes infinitely large at this velocity. This theory can also be applied to a software development team with regards to its velocity. In other words, a team cannot increase its velocity forever because the number of regression tests becomes infinitely large.

To reduce this effect, a team should automate its regression tests. Coded UI tests in Visual Studio make this very straightforward. In addition, the entire team should evaluate which tests would be appropriate for regression, considering the ROI and risk in its decision.

Lab Review Questions and Answers

Lab: Improving Testing Practices

Question and Answers

Question: What are the three ways through which you can create a coded UI test in Visual Studio?

Answer: To create a coded UI test in Visual Studio, you can use a test case's existing action recording, create a new action recording, or create it from scratch by using code.

Question: How can you make an automated test, such as a coded UI test, pass or fail on its own?

Answer: To make an automated test, such as a coded UI test, pass or fail on its own, add one or more assertions that compare a UI element's property value against an expected value.

Question: What is required before a tester can run an automated test case?

Answer: To run an automated test case, there must be an automated test, such as a coded UI test, unit test, or generic. The automated test must be associated with the test case by using Visual Studio or the tcm.exe command line utility. In addition, an automated build must be configured, run, and completed successfully. Finally, there should be a lab environment, which contains one or more physical or virtual computers running a test agent.

Question: How can you use Microsoft Test Manager to organize your regression tests?

Answer: After the team identifies which test cases are important for regression, it can create a static suite in the current test plan, and then manually add the tests cases. The team can also create a query-based test suite that looks for certain criteria, such as a priority value of 1. Some teams might also want to organize their regression tests into a separate test plan.

Question: How can a team promote test cases from the current sprint's test plan to the next sprint's test plan in such a way that it allows the team to make changes to the test cases that will not be reflected in the prior sprint's test plan?

Answer: A team should make true copies of test cases, either manually or by using the Clone Test Plan feature. Other test case promotion tools will simply create references to the original test cases, so that any changes to those test cases in the next sprint's test plan will be reflected in the prior sprint's test plan.