



FPT UNIVERSITY

CAPSTONE PROJECT

Test Guidelines

☐ Concepts

- Testing Concepts
- How to do Unit Test (UT)?
- How to do Integration/System Test?

☐ Issues

☐ Case Studies

☐ Test Type

- Functional test/Black-box test
- White-box test/Structural Test/Glass-Box Test/Transparent Test
- Non-functional test
 - Security Test
 - Performance test, Usability Test
 -Installation Test, Backup Test
- Changes-related test

☐ Test Level/Test Stages

- Unit Test/Component Test
- Integration Test (Component/System integration test)
- System Test
- Acceptance test

□ Test Techniques

- Purpose: to identify **test conditions, test cases, and test data.**
- White-box testing techniques
 - Statement testing
 - Branch/Decision Testing
- Black-box/Functional Testing Techniques
 - Equivalent Partitioning testing
 - Boundary Analysis testing
 - Decision table testing
 - State transition testing

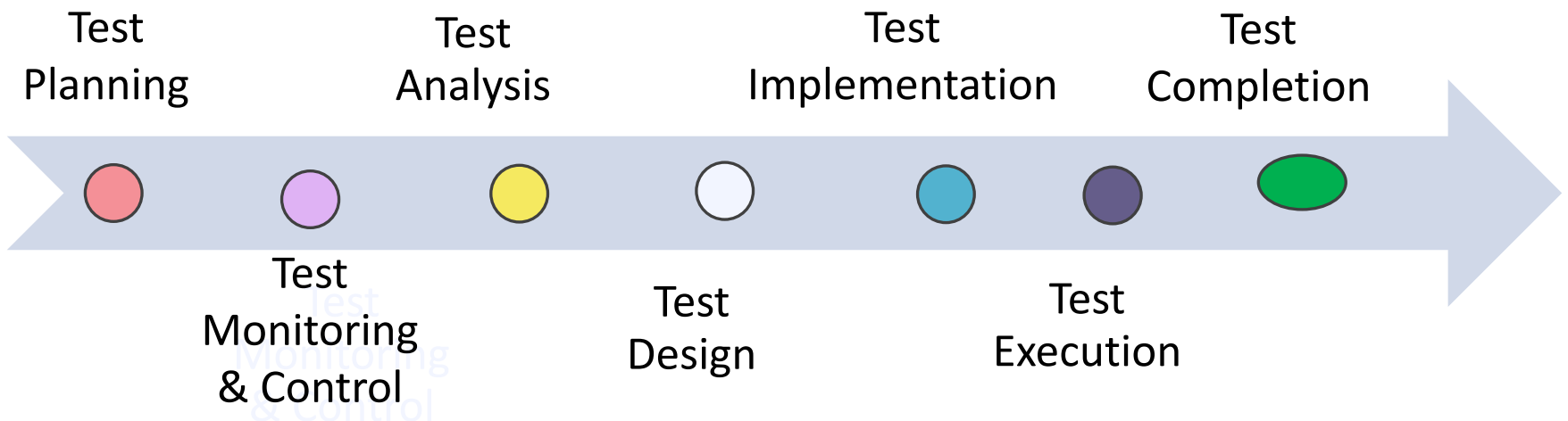
❑ Complete criteria

- Define for each testing stage/level

❑ Test Coverage

$$\text{Coverage} = \frac{\text{Number of coverage items exercised}}{\text{Total number of coverage items}} * 100\%$$

❑ Test Process Activities



□ Test Scope

- Target of test
 - Features/Functions/Non-requirements to be tested
 - Features/Functions/Non-requirements not to be tested
- Test Level/test stage
 - What levels of test will be done in the project?
 - Brief of *in-charge, inputs/time, focuses, acceptance criteria*
- Assumptions, Constraints

- ❑ Focus on testing GUIs and components
- ❑ Component Testing Techniques
 - Statement testing
 - Decision/branch testing
- ❑ How to develop UT test cases, UT script?
- ❑ UT Frameworks

- ❑ Focus on human user interface – text alignment, screen layout, font size, field size, color...
- ❑ Should use Check-list-based testing

Checklist_GUI Testing.xls [Compatibility Mode] - Excel (Product Activation Failed)

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

129 :

GUI Testing Checklist		Screen Name <Name of screen>			
Question	Yes	No	N/A	Note	
Is graphical design of GUI is consistent with other screen?					
Is one button set to be default?					
Are the controls ordered according to normal behavior (Microsoft Style)?					
Are all labels aligned uniformly?					
Are text areas aligned uniformly?					
Are there any spelling mistakes?					
Are all non-enterable text areas of the same color (gray)?					
Is the tab sequence correct?					
Are the error messages informative and not blaming the user?					
Before an action that affects the system (such as a delete) is performed, is the user asked for confirmation?					
Are date and time formats across the system consistent?					
Are number formats consistent?					
If Tooltips are used, are they helpful or meaningful?					
Are screens and menu mapped correctly?					

* Comment

* Suggestion

[] - Pass
[] - Test again
[] - Other

Test Date: dd/MM/yyyy

FunctionList GUI Checklist

Activate Windows
Go to Settings to activate Windows.

READY 100%

❑ Statement testing: Complete criteria is statement coverage

Percentage of executable statements exercised by a test suite

$$\text{Statement coverage} = \frac{\text{number of statements exercised}}{\text{total number of statements}} * 100\%$$

Example:

- Program has 100 statements
- Tests exercise 87 statements
- Statement coverage = 87%

Statement coverage is normally measured by a software tool.

❑ Decision/Branch testing: Complete criteria is branch coverage

Percentage of decision outcomes exercised by a test suite

$$\text{Branch coverage} = \frac{\text{number of decision outcomes exercised}}{\text{total number of decision outcomes}} * 100\%$$

Example:

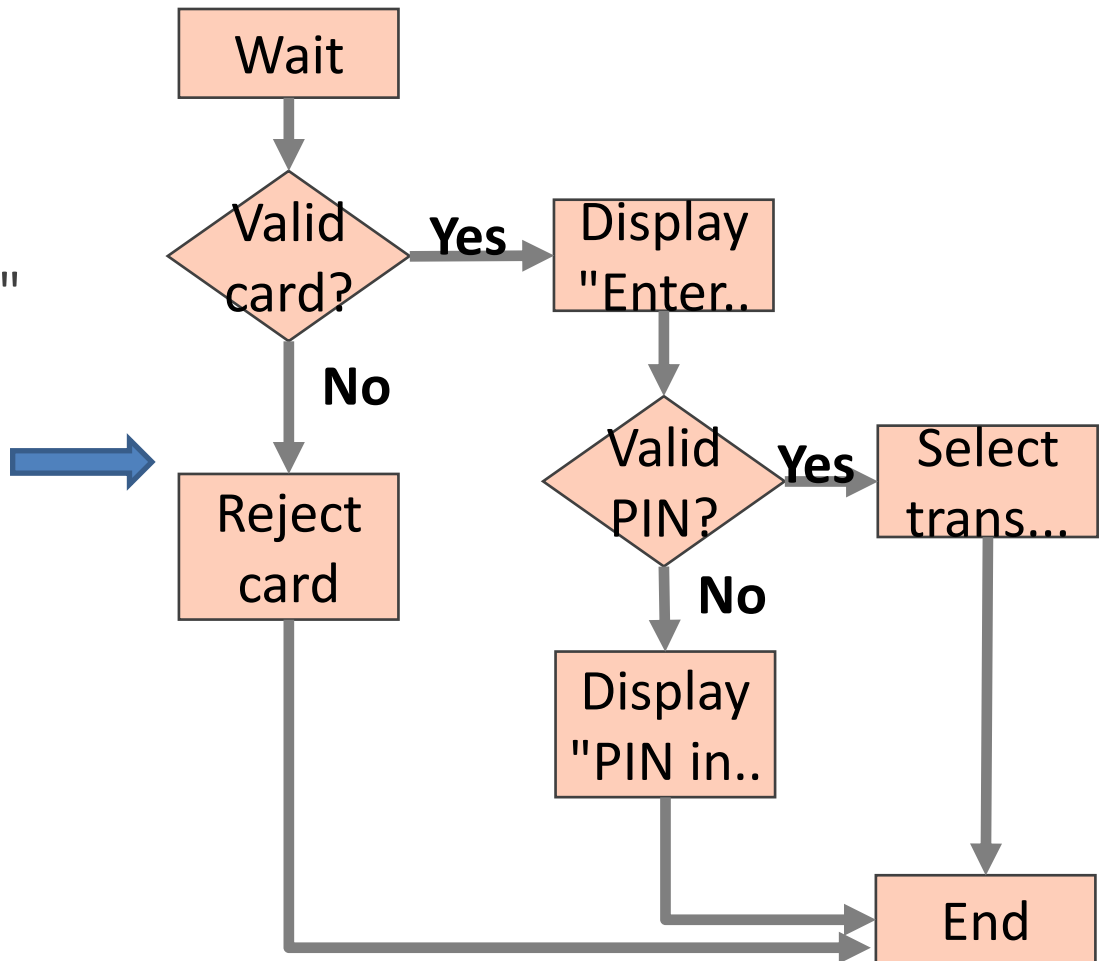
- Program has 4 branches
- Tests exercise 2 branches
- Branch coverage = 50%

Decision coverage is normally measured by a software tool.

❑ Step 1: Do code analysis & build control chart to identify test conditions and test cases

Example 1

Wait for card to be inserted
IF card is a valid card THEN
 display "Enter PIN number"
IF PIN is valid THEN
 select transaction
ELSE (otherwise)
 display "PIN invalid"
ELSE (otherwise)
 reject card
End



[illegible]

❑ Step 3: Develop script test in UT framework

- Should comment test case for each test method
- Test method name should include method name/component name + test case ID

❑ Example in Junit

```
@Test
void authenticate() {
    // Arrange
    AuthenticationLoginDto loginRequest = new AuthenticationLoginDto();
    loginRequest.setEmail("test@example.com");
    loginRequest.setPassword("password");

    UserAccount user = new UserAccount();
    user.setEmail("test@example.com");
    when(userAccountRepository.findByEmail(anyString())).thenReturn(Optional.of(user));
    when(authenticationManager.authenticate(any())).thenReturn(Ⓣ null);
    when(jwtService.generateToken(any())).thenReturn(Ⓣ "accessToken");
    when(jwtService.generateRefreshToken(any())).thenReturn(Ⓣ "refreshToken");
    when(tokenRepository.findByUserAccountAndExpiredAndRevoked(any(), anyBoolean(), anyBoolean())).thenReturn(Ⓣ Optional.empty());
    when(tokenRepository.save(any())).thenReturn(new Token());

    // Act
    AuthenticationDto authenticationDto = authenticationService.authenticate(loginRequest);

    // Assert
    assertNotNull(authenticationDto);
    assertEquals(Ⓣ expected: "accessToken", authenticationDto.getAccessToken());
    // Add more assertions if needed
}
```

☐ Java

- Junit, TestNG
- Mockito
- Jmockit
- JaCoCo (coverage tool)
- OpenClover (coverage tool)

☐ .NET & ASP.NET

- NUnit
- Unit Test framework includes in .NET MVC framework
- Visual Studio, Coverlet (coverage tool)

☐ NodeJS

- Mocha (<https://mochajs.org/>) & Chai (<https://www.chaijs.com/>)
- **Jest** (<https://jestjs.io/>)

❑ React JS & React native

- Jest (support code coverage measurement)
- React Testing Library

❑ Angular

- karma-jasmine
(<https://www.npmjs.com/package/karma-jasmine>)
- Istanbul (coverage tool)

❑ Android

- Junit

❑ Concept

- This testing ensures that the integrated modules/components work properly.
- Integration testing can start once the modules to be tested are available. This does not require another module to be completed for testing to be done, as Stubs and Drivers can be used for the same.
- It detects errors related to the interface.

❑ Techniques

- White-box and Black-box Test Techniques

❑ Frameworks

- API Testing
 - Tool : Postman
- Functional Integration Testing
 - Use same frameworks/tools with system testing

Integration Test 2/2

White-box: Develop test case for API Testing

❑ Format should be changed to be suitable with test case

The screenshot displays an Excel spreadsheet titled "Shiba Dekiru_IntegrationTest.xlsx" with a REST client interface on the right. The spreadsheet is organized into columns for test case details, and the REST client shows a GET request to "http://localhost:8080/api/post" with its response.

Test Case ID	Description	Response	Pass	Date	Tester
26	<p>1. Login</p> <p>2. Typing GET URL :http://localhost:8080/api/post</p>	<p>Reponse:</p> <pre>{ "postId": 1, "postContent": "Hướng dẫn cho người mới học tiếng nhật", "description": "cung cấp cho người dùng thông tin cần thiết để học tiếng nhật", "createdAt": "2023-11-12T16:53:29.76304", "isEnabled": true, "lectureId": 1 }, { "postId": 2, "postContent": "Cách để phát âm chuẩn như người bản địa", "description": "Tổng hợp những thông tin bổ ích giúp người dùng phát âm tốt tiếng nhật", "createdAt": "2023-11-12T17:06:31.567702", "isEnabled": true, "lectureId": 1 }</pre>		28/10/2023	KhangGT

The REST client interface on the right shows a GET request to "http://localhost:8080/api/post". The response is displayed in JSON format:

```
[
  {
    "postId": 1,
    "postContent": "Hướng dẫn cho người mới học tiếng nhật",
    "description": "cung cấp cho người dùng thông tin cần thiết để học tiếng nhật",
    "createdAt": "2023-11-12T16:53:29.76304",
    "isEnabled": true,
    "lectureId": 1
  },
  {
    "postId": 2,
    "postContent": "Cách để phát âm chuẩn như người bản địa",
    "description": "Tổng hợp những thông tin bổ ích giúp người dùng phát âm tốt tiếng nhật",
    "createdAt": "2023-11-12T17:06:31.567702",
    "isEnabled": true,
    "lectureId": 1
  }
]
```

❑ End to end testing

❑ Techniques

- Black-box test techniques
 - Business Process-based Testing
 - Use-case based testing

❑ Tools & Frameworks?

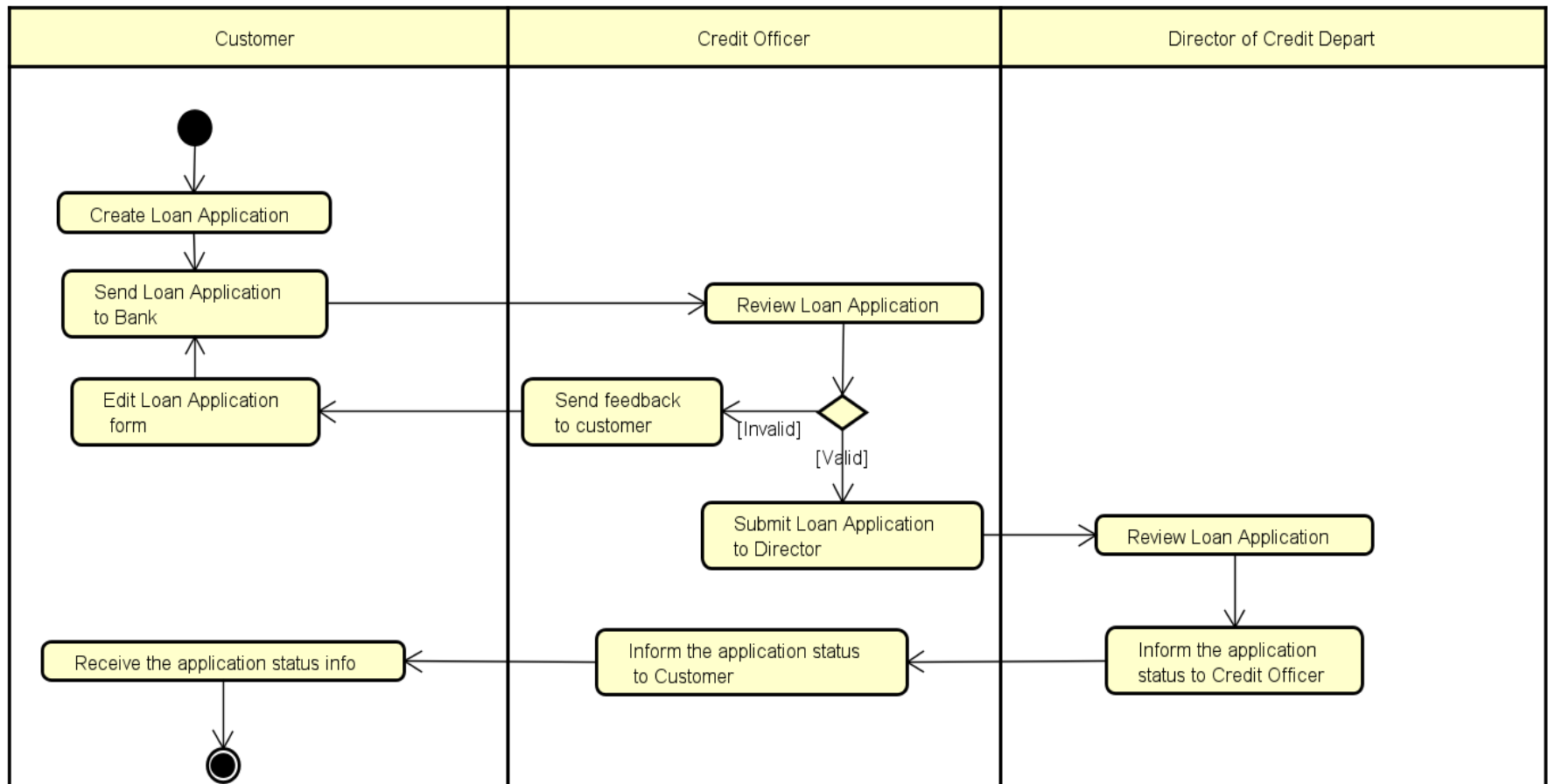
- Functional Test –same with IT
- Performance: Jmeter (Opensource), Apidog (OpenSource), Load Runner (paid), **Gatling** (opensource)

□ How to develop test cases?

- Study business processes (develop if not have)
- Identify functions involve in business processes
- Develop test case to verify flows in business process
- Identify test cases of each function in the business process
- Develop test procedure

❑ Loan Application process : Involve software functions

- Create Loan Application, Display Loan Application List, Send for Approval, Approve...



Frameworks

☐ Web App

- Selenium (open source)
- Katalon

☐ Mobile App

- Katalon (free for small team)
- TestGorilla (free for essential features)

How to develop Black-box Test cases?

Step 1: Identify Test Condition

- ❑ **Step 1:** Identify, study, analyze test basis (e.g. Functional specification, AD, Interface Spec...)
 - to identify test conditions
 - and put into a condition table
- ❑ E.g. Conditions table for Loan Application

Example: Loan Application

Customer Name

Account number

Loan amount requested

☒ Term of loan

☒ Monthly repayment

Term:

Repayment:

Interest rate:

Total paid back:

2-64 chars.

6 digits, 1st non-zero

£500 to £9000

1 to 30 years

Minimum £10

Condition	Valid Partitions	Invalid Partitions	Valid Boundaries	Invalid Boundaries
Customer name				
Account number				
Loan amount				

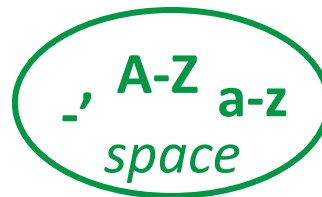
□ Step 2: Condition Analysis

- Use techniques to develop condition analysis to identify test cases
- E.g. Customer name condition

Number of characters:



Valid characters:



Any
other

Conditions	Valid Partitions	Invalid Partitions	Valid Boundaries	Invalid Boundaries
Customer name	2 to 64 chars	< 2 chars	2 chars	1 char
		> 64 chars	64 chars	65 chars
	valid chars	invalid chars		0 char

How to develop IT Test cases?

Step 2: Condition Analysis

❑ E.g. Conditions Analysis Sheet after analysis complete

Condition	Valid Partitions	Tag	Invalid Partitions	Tag	Valid Boundaries	Tag	Invalid Boundaries	Tag
Customer name	2 – 64 chars	VP1	< 2 chars	IP1	2 chars	VB1	1 char	IB1
	valid chars	VP2	> 64 chars	IP2	64 chars	VB2	65 chars	IB2
			invalid chars	IP3			0 char	IB3
Account number	6 digits	VP3	< 6 digits	IP4	100000	VB3	99999	IB4
	1 st non-zero	VP4	> 6 digits	IP5	999999	VB4	1000000	IB5
			1st digit = 0	IP6			_ (0 digit)	IB6
			non-digit	IP7				
Loan amount	500 – 9000	VP5	< 500	IP8	500	VB5	499	IB7
			> 9000	IP9	9000	VB6	9001	IB8
			0	IP10				
			non-integer	IP11				
			null	IP12				

□ Step 3: Design Test cases

- Define test cases with data test based on test objectives

Test Case	Description	Expected Outcome	New Tag Covered
1	Name: John Smith Acc. No: 123456 Loan: 2500 Term: 3 years	Term: 3 years Repayment: 79.86 Interest rate: 10% Total paid: 2874.96	V1, V2, V3, V4, V5,...
2	Name: AB Acc. No: 100000 Loan: 500 Term: 1 year	Term: 1 year Repayment: 44.80 Interest rate: 7.5% Total paid: 537.60	B1, B3, B5...

□ Step 4: Implement/Develop Test case

- Develop Test Data
- Develop Test Procedures (if test GUI functions)
- Develop message lists (Use requirements & design documents)
- Put into Test Cases template
 - Use UT Test Case Template for API Test (**Report5.1_Unit Test.xls**)
 - Use Functional Test Case Template for GUI Function Test (**Report5.2_Integration Test.xlsx**)

❑ This TC related to Create Loan Application, Display Loan App List, Approve...

Shiba Dekiru_SystemTest.xlsx - Excel

Ha Pham Ngoc (FU HN)

	A	B	C	D	E	F	G	H	I	K
33	[TC-21]	Update class work Successfully Update a new card successfully.	1. Login into system. 2. In homepage screen go to "TRANG GIẢNG VIÊN" Screen 3. Click "Danh sách lớp" button, system display class. 3. Click to eyes icon to view	1. After step 6 the system displays a message "Cập nhật bài học trên lớp thành công".	Pass	15/11/2023	ToanHD	Normal		
34	[TC-22]	Update class work Successfully - Maximum Length Accepted "Tên bài học" Successfully update class work successfully.	1. Login into system. 2. In homepage screen go to "TRANG GIẢNG VIÊN" Screen 3. Click "Danh sách lớp" button, system display class. 3. Click to eyes icon to view	1. After step 6, the system displays a message "Cập nhật bài học trên lớp thành công".	Pass	15/11/2023	ToanHD	Normal		
35	[TC-23]	Update class work Fail - Null Tên bài học Failed updateclass work because user does not input Tên bài học.	1. Login into system. 2. In homepage screen go to "TRANG GIẢNG VIÊN" Screen 3. Click "Danh sách lớp" button, system display class. 3. Click to eyes icon to view	1. After step 6, the system displays a message "Tên bài học không được để trống".	Pass	15/11/2023	ToanHD	Abnormal		
	[TC-24]	Update class work Fail - Over Maximum Length	1. Login into system. 2. In homepage screen go to "TRANG GIẢNG VIÊN" Screen 3. Click "Danh sách lớp" button, system display class. 3. Click to eyes icon to view	1. After step 6, the system displays a message "Tên bài học không được để trống".	Pass	15/11/2023	ToanHD	Abnormal		

Ready

Type here to search

ENG US 19:11 08/06/2024

☐ Individual Test Case Report

- Test case filled test result

☐ Test Summary Reports : A test report prepared at the end of a test activity / a test level.

- UT Report
- IT Report
- ST Report
- AT Report

☐ Defect Reports

☐ Not Execute Test

- Have not UT
- Test case filled test result with-out execute test

☐ Test not follow process

- Only write test case not have evidence
- Not execute IT different with ST
- Test report filled test result with only “Pass”
- Have not user but fill AT Report

☐ Have not Defect Reports

- ☐ Not Execute Test
- ☐ Test not follow enough process
- ☐ Test with right process of real project.

- ❑ Developer not execute UT and IT
- ❑ Tester not execute ST because coding not finish on-time
- ❑ Developer and Tester not log bug
 - don't know how to log Bug (concept/process/tool).
 - Not enough time to log Bug

❑ Test not enough for right process of real project.

- UT report : G1_SHSS Unit Test
 - Only write UT test case with-out evidence

G1_SHSS_Unit Test.xlsx - Excel

Ha Pham Ngoc (FU HN)

File Home Insert Page Layout Formulas Data Review View Help Power Pivot Tell me what you want to do

Normal Page Break Preview Page Custom Workbook Views Ruler Formula Bar Gridlines Headings Zoom 100% Zoom to Selection New Arrange Freeze Panes Split Hide View Side by Side Synchronous Scrolling Switch Windows Macros

A1 Code Module

Code Module	Category	Method	testCreateCategory				
Created By	Link	Executed By	Link				
Test requirement							
Passed	Failed	Untested	N/A/B	Total Test Cases			
4	1	0	2	1	2	5	
Precondition							
database connected			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
data setting			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
role "admin"			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Return							
message			Successfully	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exception							
throw exception			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log message							
Category create successfully			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Type(N : Normal, A : Abnormal, B : Boundary)			N	N	B	B	A
Passed/Failed			P	P	F	P	P
Executed Date			0	0	0	0	0
Defect ID			1	1	1	1	1

testGetUserProfile testExportExcel createExamTest updateExamTest testCreateCategory

Ready

Type here to search

Mura... ENG US 17:21 09/06/2024

❑ Test not enough for right process of real project.

- IT report: G1 SHSS Integration Test 1.0
 - Only plan testing screen flow with-out evidence

G1_SHSS_Integration Test 1.0.xlsx - Excel

Ha Pham Ngoc (FU HN)

File Home Insert Page Layout Formulas Data Review View Help Power Pivot Tell me what you want to do

Clipboard Font Alignment Number Styles Cells Editing

D10 Expected Results

Testing Round	Passed	Failed	Pending	N/A
Round 1	39	6	0	0
Round 2	41	4	0	0
Round 3	45	0	0	0

Feature	Test requirement	Test exam management related use case and function	Expected Results
PostManagement Feature	Test exam management related use case and function		
Number of TCs	45		
TC_FL_03	Test availability of show detailed	1. Click up arrow icon	Show detailed information of the
TC_FL_04	Test availability of hide detailed	1. Click down arrow icon	Hide information of the question.
FAQs Details			
TC_FD_01	Test viewing of FAQs detail	1. Click "FAQs" on the nvbar	FAQs form is display with the
TC_FD_02	Test availability of show detailed	1. Click up arrow icon	Show detailed information of the
TC_FD_03	Test availability of hide detailed	1. Click down arrow icon	Hide information of the question.
Post List			
TC_PL_01	Test viewing of post list	1. Click "Dashboard" 2. Choose "Quản lý bài đăng"	Post list form is display with the following formation:

Common Feature UserManagement ExaminationManagement PostManagement CategoryM ...

❑ Test not enough for right process of real project.

- ST report: [G1_SHSS_System_Test_Case_v1.1](#)
 - Not fill data test

G1_SHSS_System_Test_Case_v1.1.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Help Power Pivot Tell me what you want to do

Clipboard Font Alignment Number Styles Cells Editing

B15 Verify the Create Post function when the user enters data into fields:

Workflow	Test requirement	Number of TCs	Testing Round	Passed	Failed	Pending	N/A
PostManagement	Verify the edit, add new, delete Post and manage post functionalities	16	Round 1	15	1	0	0
			Round 2	15	1	0	0
			Round 3	16	0	0	0

Test Case ID	Test Case Description	Test Data	Test Result	Test Date
[PostManagement-5]	Verify the Create Post function when the user enters data into fields: - Post name: input chars with length 2 - 100 and name doesn't exist in DB - Post's category: select the	1. Enter Website URL into location field of WebBrowser and enter 2. Click on "Login" tab 3. Enter the correct user name and password of Post manager account 4. Click on "Post Manager" Drop down list menu 5. Click on "Tạo Mới" tab	5. Create Post screen is displayed with the following fields: -Post Name: - Slug status: read only - Description: empty field -Thumbnails: empty field - Post's category: empty field	Must login by admin account Passed 24/3/202

Test Report Test Case List User Management Examination Management PostManagement

Ready Type here to search

ENG 17:50
US 09/06/2024

- ❑ Test not enough for right process of real project.
 - Bug Tracking: Have not bug tracking evidence

❑ Test with right process of real project.

- UT report: [SEP490 G49 Unit Test Evidence](#)

```
32) WritingQuestionServiceImplTest

@Test
void getWritingQuestionByWriting() {
    // Mock data
    Writing writing = new Writing();
    when(writingQuestionRepository.findAllByWriting(writing)).thenReturn(new ArrayList<>());

    // Test
    var result = writingQuestionService.getWritingQuestionByWriting(writing);

    // Assertions
    assertNotNull(result);
    assertTrue(result.isEmpty());
}

@Test
void getWritingQuestionById_WhenExists() {
    // Mock data
    Long id = 1L;
    WritingQuestion writingQuestion = new WritingQuestion();
    when(writingQuestionRepository.findById(id)).thenReturn(Optional.of(writingQuestion));

    // Test
    var result = writingQuestionService.getWritingQuestionById(id);
}
```

❑ Test with right process of real project.

- IT report: SEP490 G49 IntegrationTest

The screenshot displays an Excel spreadsheet titled "SEP490_G49_IntegrationTest.xlsx" with a REST client interface overlaid on the right. The spreadsheet contains test data for a PUT request to the endpoint `http://localhost:8080/api/admin/lesson/listening/4`. The test steps, request body, and response are detailed in the table below.

Step	Request Body	Response
1. Login		
2. Typing PUT URL	<code>http://localhost:8080/api/admin/lesson/listening/{id}</code>	
3. Request body:	<pre>{ "title": "Listening3.1", "link": "Listening3.1.mp3", "script": "Listening 3.1", "lessonId": 1}</pre>	<pre>{ "listeningId": 4, "title": "Listening3.1", "link": "Listening3.1.mp3", "script": "Listening 3.1", "lessonId": 1}</pre>

The REST client interface shows the PUT request details, including the URL, parameters, headers, and the JSON response body. The response body is displayed in both raw and pretty formats.

❑ Test with right process of real project.

■ ST report: SEP490 G49 SystemTest

The screenshot shows an Excel spreadsheet titled 'SEP490_G49_SystemTest.xlsx' with the following data:

	C	D	E	F	G	H	I	J
1102	<ol style="list-style-type: none"> 1. Login into system 2. On the "Home" screen, select the menu in the upper right corner. 3. Click button "TRANG GIẢNG VIÊN" 4. Click button "Quản lý bài kiểm tra" 5. Click the eye icon button "Chi tiết" under the "Hành động" section 6. Click button "Ngữ pháp và từ vựng" 7. Click the eye icon button "Chi tiết" under the "Hành động" section 8. Click the pen icon button "Cập nhật" under the "Hành động" section 9. In put question information 10. Click button "Update" 	<ol style="list-style-type: none"> 1. After step 3, the system displays "TRANG GIẢNG VIÊN" screen 2. After step 4, the system displays manage test 3. After step 5, the system displays test detail 4. After step 6, the system displays the Reading test list 5. After step 7, the system displays the Reading question test table 6. After step 10, the system display a new Reading question 		Pass	15/11/2023	HoaCM	Normal	
115	<ol style="list-style-type: none"> 1. Login into system 2. On the "Home" screen, select the menu in the upper right corner. 3. Click button "TRANG GIẢNG VIÊN" 4. Click button "Quản lý bài kiểm tra" 5. Click the eye icon button "Chi tiết" under the "Hành động" section 	<ol style="list-style-type: none"> 1. After step 3, the system displays "TRANG GIẢNG VIÊN" screen 2. After step 4, the system displays manage test 3. After step 5, the system displays test detail 4. After step 6, the system displays 		Pass	15/11/2023	HoaCM	Normal	

The spreadsheet also includes a sidebar with a 'Test case List' and a 'Guest Admin' section. The bottom of the image shows the Windows taskbar with the date 09/06/2024 and time 17:08.

❑ Test with right process of real project.

- Bug Tracking: SEP490 G49 Bug Tracking

The screenshot shows an Excel spreadsheet titled "SEP490_G49_Bug_Tracking.xlsx" with the following data:

	E	F	G	H	I	J
	the system displays vocabulary list with name, meaning and how to read in hiragana and example.	the system displays vocabulary list with name, meaning and how to read in hiragana.	KhangGT	System Test	Closed	20/10/2023
4	The system does not display the newly created listening test	The system displays the newly created listening test	KhangGT	System Test	Closed	01/11/2023

The right sidebar shows a list of bugs and a detailed view of a specific bug titled "Bug guest + student" with the following details:

- Thông báo:** Nhấn + Theo dõi
- Mô tả:** View vocabulary list doesn't need show example. View grammar detail with explanations and examples overlap. View kang detail lack for the on sound, the kun sound, example.
- Hoạt động:** Viết bình luận...
- Chỉnh sửa:** Hiện chi tiết
- Đã gọi ý:** Tham gia
- Tiến hành:** Thành viên, Nhấn, Việc cần làm, Ngày, Định kiến, Ảnh bìa, Trường tùy chỉnh
- Tiện ích bổ sung:** Thêm Tiện ích bổ sung
- Tự động hóa:** Thêm nút
- Thao tác:** Di chuyển, Sao chép, Tạo mẫu, Lưu trữ, Chia sẻ

