

Introduction to Software Engineering

Software Testing

Software Testing documentation for the assigned course project, following the attached template.



Software Engineering Department
Faculty of Information and Technology
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Table of Contents

Objectives	1
1 Member Contribution Assessment.....	2
2 Test plan	3
3 Test cases.....	4
3.1 List of test cases	4
3.2 Test case specifications	4

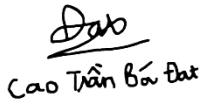

Software Testing

Objectives

This document focus on the following topics:

- ✓ Completing the Software Testing document with the following sections:
 - Test Plan
 - Test Cases
- ✓ Understanding the Software Testing document.

1 Member Contribution Assessment

ID	Name	Contribution (%)	Signature
23127097	Trần Trí Nhân	100%	
23127168	Cao Trần Bá Đạt	100%	 Cao Trần Bá Đạt
23127193	Bùi Quang Hùng	100%	 Bùi Quang Hùng
23127234	Nguyễn An Nghiệp	100%	 Nguyễn An Nghiệp
23127238	Trần Hoài Thiện Nhân	100%	 Trần Hoài Thiện Nhân

2 Test plan

2.1 Test techniques:

- The primary testing methodology used by our team is dynamic V&V or software testing, which involves running the software with test data.
- Using dynamic V&V helps our team discover bugs and malfunctions in the application in a more intuitive way, which allows faster and more reliable delivery of the final working product.
- Our team mainly focuses on using the Black-box testing (functional testing) method to ensure that the current version of the software meets the core requirements as stated in the requirement analysis and software design documents.
- Our team applies the requirements-based testing approach as an overall testing strategy to guarantee every important use case has a corresponding set of tests.

2.2 Test objects:

- The testing will be performed on core functionalities to make sure that they meet the requirements. Performance, usability and security testing, as well as requirement review are out of scope for this testing.
- Key functionalities to be tested:
 - User login
 - Bot creation
 - Bot configuration
 - Chat with bots
 - Group management (creating, update, deleting)

2.3 Environment:

2.3.1 Hardware:

- Personal computer or smart phone with internet connection.

2.3.2 Software:

- Operating systems: Windows 10, Windows 11
- Web browsers:
 - Chrome version 143
 - Firefox version 146
 - Edge version 143

2.4 Schedule:

Task	Date
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Create test plan	18/12/2025
Design test cases	19/12/2025 - 20/12/2025
Execute test cases and evaluate results	21/12/2025 - 22/12/2025

3 Test cases

3.1 List of test cases

Seq	Test case	Target	Description
1	Login with valid email address and password	User Login	Verify successful login and authentication with correct email address and password
2	Login with incorrect email address	User Login	Verify the system error handling when inputting the wrong email address of a user
3	Login with blank email address	User Login	Verify the system error handling when leaving the password field blank
4	Create Group with Empty Input	Create Group (Validation)	Verify that the system displays appropriate error messages when "Group Name" and "Member Emails" fields are left blank.
5	Create Group with Valid Input	Create Group	Verify that a new group is successfully created and correctly stored in the database when providing valid input data.
6	Update Group's Members with Empty Member_Emails	Update Group's Members	Ensure the system prevents updating a group if all member emails are removed, displaying a validation error.
7	Update Group's Members with Valid Member_Emails	Update Group's Members	Verify that the group's member list is successfully

			updated in the database when valid emails are provided.
8	Update Group's Bots with Empty GroupIDs	Update Group's Bots	Verify that a bot can be unlinked from all groups (cleared) and the status is correctly updated in the database.
9	Update Group's Bots with Valid GroupIDs	Update Group's Bots	Verify that a bot is correctly shared with all selected groups and data is accurately reflected in the database.
10	Delete Group	Delete Group	Confirm that a group is successfully removed from the system and its record is deleted from the database.
11	Create bot with website URL	Create Bot page	Verify bot can be created using website as knowledge source
12	Create bot with uploaded file	Create Bot page	Verify bot can be created using uploaded file
13	Adjust bot response	Test Bot page	Verify bot follows response adjustment instruction
14	Configure Bot with Valid Input	Configure Bot	Verify that the bot configuration is saved successfully and the system redirects to the Create Bot screen when a valid bot name, AI model, and group sharing are provided.
15	Configure Bot with Empty Bot Name	Configure Bot (Validation)	Verify that the system automatically assigns the default name "Unnamed Bot" when the bot

			name field is left empty and saves the configuration successfully.
16	Test Chat After Bot Configuration using Upload File	Test Bot (Knowledge Base)	Verify that the bot responds correctly based on the knowledge extracted from the uploaded PDF file during Test Chat.
17	Test Chat After Bot Configuration using Website Link	Test Bot (Knowledge Base)	Verify that the bot retrieves and utilizes knowledge from the configured website URL to answer user queries in Test Chat.
18	Test Chat After Bot Configuration using Adjusting Method	Test Bot (Response Adjustment)	Verify that the bot responds according to the adjusted response rules when a predefined question is detected.
19	Chat with a bot	Chatting	You can view your question and the bot's answer, as well as the timestamps of the messages, and save the latest information from this conversation to the database
20	Send a ticket	Report the error to the management system	When submitting a ticket, you can describe the problem, and its record is deleted from the database
21	Create a chat with a bot that already has a chat history	Continue chatting	Access the bot's chat page and continue chatting
22	Create a new chat with a bot that doesn't have a chat history	New chat	Access the bot's chat page and start a conversation from scratch, but it won't be saved to the database yet because it will only contain

			the bot's default questions
23	Delete chat history	Delete chat history	Permanently delete the bot's chat history, and its record is deleted from the database
24	Which groups does the view bot belong to?	You can view the groups if they exist	You can see which groups the bot belongs to, if available
25	View chat history, but the bot is inactive	View only, no chat	Old messages are visible, but there will be no text input box, a send ticket button, or a message submission button
26	View chat history, but the bot is active	View only, can chat	Old messages can be viewed, and you can chat or submit a ticket
27	Test chat in create bot	Received an answer	You can view your question and the bot's answer, but it won't be saved to the database
28	Test chat in edit bot	Received an answer	You can view your question and the bot's answer, but it won't be saved to the database

3.2 Test case specifications

3.2.1 Test case 1

Test case	Login with valid email address and password
Related Use case	User login
Context	Login with correct email address and password
Input Data	<ol style="list-style-type: none"> Email address: alice@example.com Password: 12345678
Expected Output	<ol style="list-style-type: none"> Authenticated Redirect to user account page

<i>Test steps</i>	<ol style="list-style-type: none"> 1. Enter email address: alice@example.com 2. Enter password: 12345678 3. Click 'Sign In' button or hit Enter
<i>Actual Output</i>	Same as expected output
<i>Result</i>	<i>Passed</i>

3.2.2 Test case 2

<i>Test case</i>	<i>Login with incorrect email address</i>
<i>Related Use case</i>	User login
<i>Context</i>	Login with incorrect email address
<i>Input Data</i>	<ol style="list-style-type: none"> 1. Email address: a@a 2. Password: 12345678
<i>Expected Output</i>	<ol style="list-style-type: none"> 1. Disallow user to log in 2. Show a general incorrect credential error, like 'Invalid email or password'
<i>Test steps</i>	<ol style="list-style-type: none"> 1. Enter email address: a@a 2. Enter password: 1234578 3. Click 'Sign In' button or hit Enter
<i>Actual Output</i>	Same as expected output
<i>Result</i>	<i>Passed</i>

3.2.3 Test case 3

<i>Test case</i>	<i>Login with blank email address</i>
<i>Related Use case</i>	User login
<i>Context</i>	Login with blank email address
<i>Input Data</i>	<ol style="list-style-type: none"> 1. Email address: 2. Password: 12345678
<i>Expected Output</i>	<ol style="list-style-type: none"> 1. Disallow user to log in 2. Show an indication to kindly remind the user to fill out the missing field.
<i>Test steps</i>	<ol style="list-style-type: none"> 1. Enter blank email address 2. Enter password: 1234578 3. Click 'Sign In' button or hit Enter
<i>Actual Output</i>	<ol style="list-style-type: none"> 1. Disallow user to log in 2. Highlight the email field with the cursor blinking to suggest the user to enter the missing address
<i>Result</i>	<i>Passed</i>

3.2.4 Test case 4

Test case	Create Group with Valid Input
<i>Related Use case</i>	Create Group
<i>Context</i>	On the group creation page, enter the information in the fields to create a group.
<i>Input Data</i>	<ol style="list-style-type: none"> 1. GroupName: Create Group Testcase, 2. Member_Emails: aidomatuikobik1@gmail.com
<i>Expected Output</i>	<ol style="list-style-type: none"> 1. Group created. 2. New group data is updated in the database.
<i>Test steps</i>	<ol style="list-style-type: none"> 1. On the group creation page 2. Click "New Group" 3. Enter the input in the fields. 4. Click "Creat Group".
<i>Actual Output</i>	The same ER.
<i>Result</i>	<i>Passed</i>

3.2.5 Test case 5

Test case	Update Group's Members with Valid Member_Emails
<i>Related Use case</i>	Update Group's Members
<i>Context</i>	On the group creation page, enter the information in the fields to edit a group.
<i>Input Data</i>	<ol style="list-style-type: none"> 1. Member_Emails="aidomatuikobik1@gmail.com"
<i>Expected Output</i>	<ol style="list-style-type: none"> 1. Group updated. 2. New group data is updated in the database.
<i>Test steps</i>	<ol style="list-style-type: none"> 1. Click "Edit" a Group. 2. Enter email in Member_Emails field. 3. Click "Update Group".
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.6 Test case 6

Test case	Update Group's Bots with Valid GroupIDs
<i>Related Use case</i>	Update Group's Bots
<i>Context</i>	In the bot's sharing list, on create bot page or edit bot page.

<i>Input Data</i>	1. Checked all groups in list.
<i>Expected Output</i>	1. Bot is shared with all groups. 2. Data is updated in the database.
<i>Test steps</i>	1. On Share with Groups. 2. Click "Select Group". 3. Checked all groups. 4. Click "Update".
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.7 Test case 7

Test case	Create bot with website URL
<i>Related Use case</i>	Create Bot.
<i>Context</i>	User is logged in and on Create Bot page
<i>Input Data</i>	1. Bot name = "Support Bot" 2. AI Model = "Gemini 2.5 Pro" 3. Add Website Link = URL 4. URL = https://en.wikipedia.org/wiki/Vietnam
<i>Expected Output</i>	1. Print a notification that the website link has been uploaded and bot is created successfully
<i>Test steps</i>	1. Open Create Bot page. 2. Enter bot name. 3. Choose AI Model. 4. Click "Add Website Link". 5. Enter valid URL. 6. Click "Create Bot".
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.8 Test case 8

Test case	Create bot with uploaded
<i>Related Use case</i>	Create bot.
<i>Context</i>	User is logged in and on Create Bot page.
<i>Input Data</i>	1. Bot name = "Support Bot" 2. AI Model = "Gemini 2.5 Pro" 3. Add Website Link = URL
<i>Expected Output</i>	1. File is uploaded, content extracted and appeared on the screen, and bot is created

<i>Test steps</i>	<ol style="list-style-type: none"> 1. Open Create Bot page. 2. Enter bot name. 3. Choose AI Model. 4. Click “Upload File”. 5. Choose File from disk. 6. Click “Create Bot”.
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.9 Test case 9

<i>Test case</i>	<i>Adjust bot response</i>
<i>Related Use case</i>	Test Bot.
<i>Context</i>	User is logged in and on Create Bot page.
<i>Input Data</i>	<ol style="list-style-type: none"> 1. Adjustment = “If someone asks "who are you?", you should answer "botchat helpdesk for businesses".”. 2. User message = “Who are you?”.
<i>Expected Output</i>	1. Website content is extracted and bot is created successfully
<i>Test steps</i>	<ol style="list-style-type: none"> 1. Create bot successfully. 2. Enter adjustment text. 3. Send test message.
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.10 Test case 10

<i>Test case</i>	<i>Configure Bot with Valid Input</i>
<i>Related Use case</i>	Configure Bot
<i>Context</i>	The user configures a chatbot on the Bot Details & Testing page
<i>Input Data</i>	Bot Name = “Selling car ” AI Model = “Gemini 2.5 Flash”
<i>Expected Output</i>	The bot is saved successfully without any error messages
<i>Test steps</i>	<p>Step One: On the Create Bot screen, click the View button of the selected bot (Selling car bot).</p> <p>Step Two: On the Bot Details & Testing page, enter a valid Bot Name.</p> <p>Step Three: Select the AI Model as Gemini 2.5 Flash.</p> <p>Step Four: Select the Group button, choose the group and click Share button.</p> <p>Step Four: Click the Save Changes button.</p>

<i>Actual Output</i>	The bot is saved successfully, and the system redirects to the Create Bot screen.
<i>Result</i>	<i>Passed</i>

3.2.11 Test case 11

<i>Test case</i>	<i>Test Chat After Bot Configuration using an Upload file</i>
<i>Related Use case</i>	Test Bot (Knowledge Base)
<i>Context</i>	The user configures the chatbot knowledge base using an uploaded file and tests the bot response
<i>Input Data</i>	Test message = "Ai là người biên soạn file 01_Software Engineering Introduction.pdf?"
<i>Expected Output</i>	Response = "Tôi là mô hình ngôn ngữ lớn được huấn luyện bởi một file pdf do Thầy Trần Duy Hoàng biên soạn."
<i>Test steps</i>	<p>Step One: On the Create Bot screen, click the View button of the configured bot(Selling car bot).</p> <p>Step Two: Click Upload file button, upload this file(link: https://drive.google.com/file/d/130oil11uwp9VLGZS-Whgn_ltpb1m748p/view?usp=drive_link)</p> <p>Step Three: Click save change.</p> <p>Step Four: Go to bot's view again and add "Ai là người biên soạn file 01_Software Engineering Introduction.pdf?" in Test Chat.</p>
<i>Actual Output</i>	The bot replies: "Tôi là một mô hình ngôn ngữ lớn, được huấn luyện bởi Google, được huấn luyện bởi một file pdf do Thầy Trần Duy Hoàng biên soạn".
<i>Result</i>	<i>Passed</i>

3.2.12 Test case 12

<i>Test case</i>	<i>Test Chat After Bot Configuration using adjusting method</i>
<i>Related Use case</i>	Test Bot (Response Adjustment)
<i>Context</i>	The user handles and answers correctly when meeting an adjusted question.
<i>Input Data</i>	"Nếu hỏi ai là người huấn luyện dữ liệu cho bạn thì trả lời là Bá Đạt."
<i>Expected Output</i>	Bot response based on adjusted document "Người huấn luyện dữ liệu cho tôi là Bá Đạt."
<i>Test steps</i>	<p>Step One: On the Create Bot screen, click the View button of the configured bot(Selling car bot).</p> <p>Step Two: Add "Nếu hỏi Ai là người tạo ra bạn thì trả lời người tạo ra tôi là Bá Đạt".</p> <p>Step Three: Click save change.</p> <p>Step Four: Go to bot's view again and add "Ai là người tạo ra bạn" in Test Chat.</p>

<i>Actual Output</i>	The bot replies: "Tôi là một mô hình ngôn ngữ lớn, được huấn luyện bởi Google, được huấn luyện bởi một file pdf do Thầy Trần Duy Hoàng biên soạn".
<i>Result</i>	<i>Failed</i>

3.2.13 Test case 13

<i>Test case</i>	<i>Delete chat history</i>
<i>Related Use case</i>	Delete chat history
<i>Context</i>	I want to delete my chat history with the bot
<i>Input Data</i>	UserID and BotID
<i>Expected Output</i>	The chat logs have been deleted, are no longer visible, and the database is gone
<i>Test steps</i>	<ol style="list-style-type: none"> 1. On chat page 2. Click the delete bot button in the sidebar when you hover your mouse over the bot
<i>Actual Output</i>	The bot doesn't need to be in the sidebar; my chat history with the bot has disappeared from the UI and database, redirecting me back to the default bot - Customer Support Bot
<i>Result</i>	<i>Failed</i>

3.2.14 Test case 14

<i>Test case</i>	<i>Chat with a bot</i>
<i>Related Use case</i>	Chat
<i>Context</i>	Send your question to the bot, and the bot will answer it, whether it can answer it or not
<i>Input Data</i>	Question: "cho toi biet noi dung pa3"
<i>Expected Output</i>	Answer: "Noi dung pa3 la Software design"
<i>Test steps</i>	<ol style="list-style-type: none"> 1. On chat page 2. Click on bot "HUP" in sidebar 3. Enter question "cho toi biet noi dung pa3" 4. Click button Send 5. See answer
<i>Actual Output</i>	The same ER
<i>Result</i>	<i>Passed</i>

3.2.15 Test case 15

Test case	Send a ticket
<i>Related Use case</i>	Send ticket
<i>Context</i>	Send a notification to the management system that the bot is having problems
<i>Input Data</i>	BotID, doc.id and ticket name
<i>Expected Output</i>	The ticket has been successfully sent
<i>Test steps</i>	<ol style="list-style-type: none">1. On chat page2. Click on bot "HUP" in sidebar3. Click button alert4. Enter "Incorrect answer" in box ticket name5. Click button "Send ticket"6. Click button "OK" when you receive a message that the ticket has been successfully submitted.
<i>Actual Output</i>	The ticket has been successfully submitted and a notification has been displayed on the screen
<i>Result</i>	<i>Passed</i>