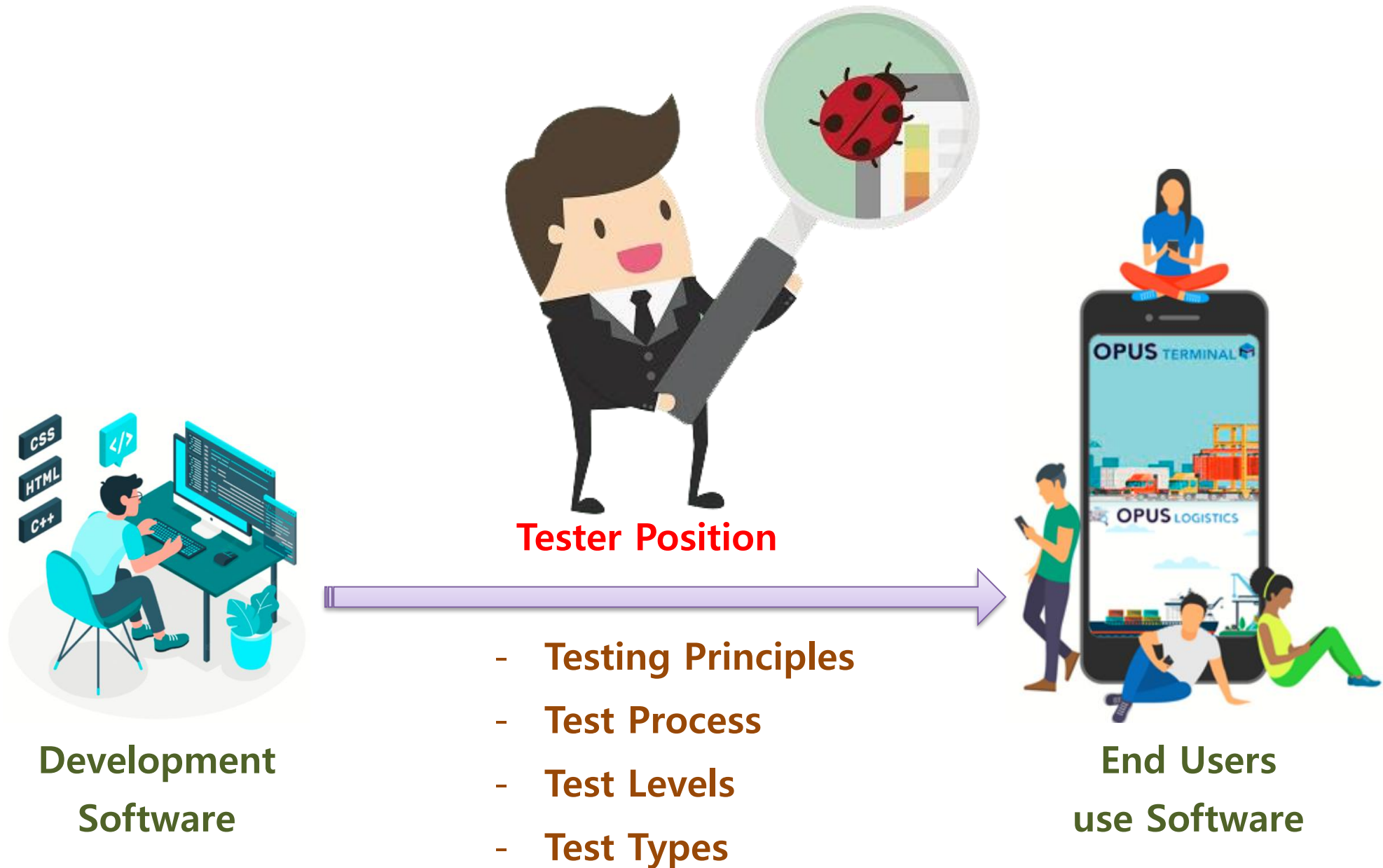


Fundamentals of Testing

Quality Control Training Programs

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Lesson 02

2.1 What is Software Testing – Who is Tester

2.2 Why is Testing necessary

2.3 Testing Principles

2.4 Test Process

2.5 Test Levels

2.6 Test Types

2.7 The Psychology of Testing

2.8 Manual Testing & Automated Testing

What is Software Testing

- **Software Testing** is a method to check whether the actual software product matches expected requirements and to ensure that the software product is defect-free.
- It involves the execution of software/system components using manual or automated tools to evaluate one or more properties of interest.



Who is Tester

- **Quality Assurance** A process for providing adequate assurance that the software products and processes in the product life cycle conform to their specific requirements and adhere to their established plans.
- **Quality Control** A set of activities designed to evaluate a developed working product

The key difference to remember is that

Quality Assurance is interested in the process

whereas

Quality Control is interested in the product

QA vs QC

QA

QC

Process

Product

Proactive

Reactive

Staff
Function

Line Function

Prevent
Defects

Find Defects



Typical Responsibilities of a Tester



- Find Problems

- Find bugs
- Find design issues
- Find more efficient ways to find bugs

- Communicate Problems

- Report bugs and design issues
- Report on testing progress
- Evaluate and report the program's stability

- More Senior Testers Manage / Supervise Testing Projects

- Prepare test plans and schedules
- Estimate testing tasks, resources, time and budget
- Measure and report testing progress against milestones
- Teach other testers to find bugs

Typical Responsibilities of a Tester

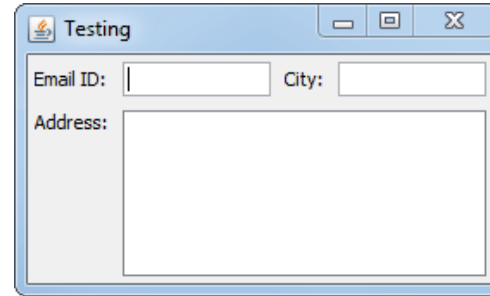
- Find Problems



Technical skill

Domain knowledge

.....



- Communicate Problems



Report skill

Communicate skill

.....



- More Senior Testers Manage / Supervise Testing Projects



Leadership

.....

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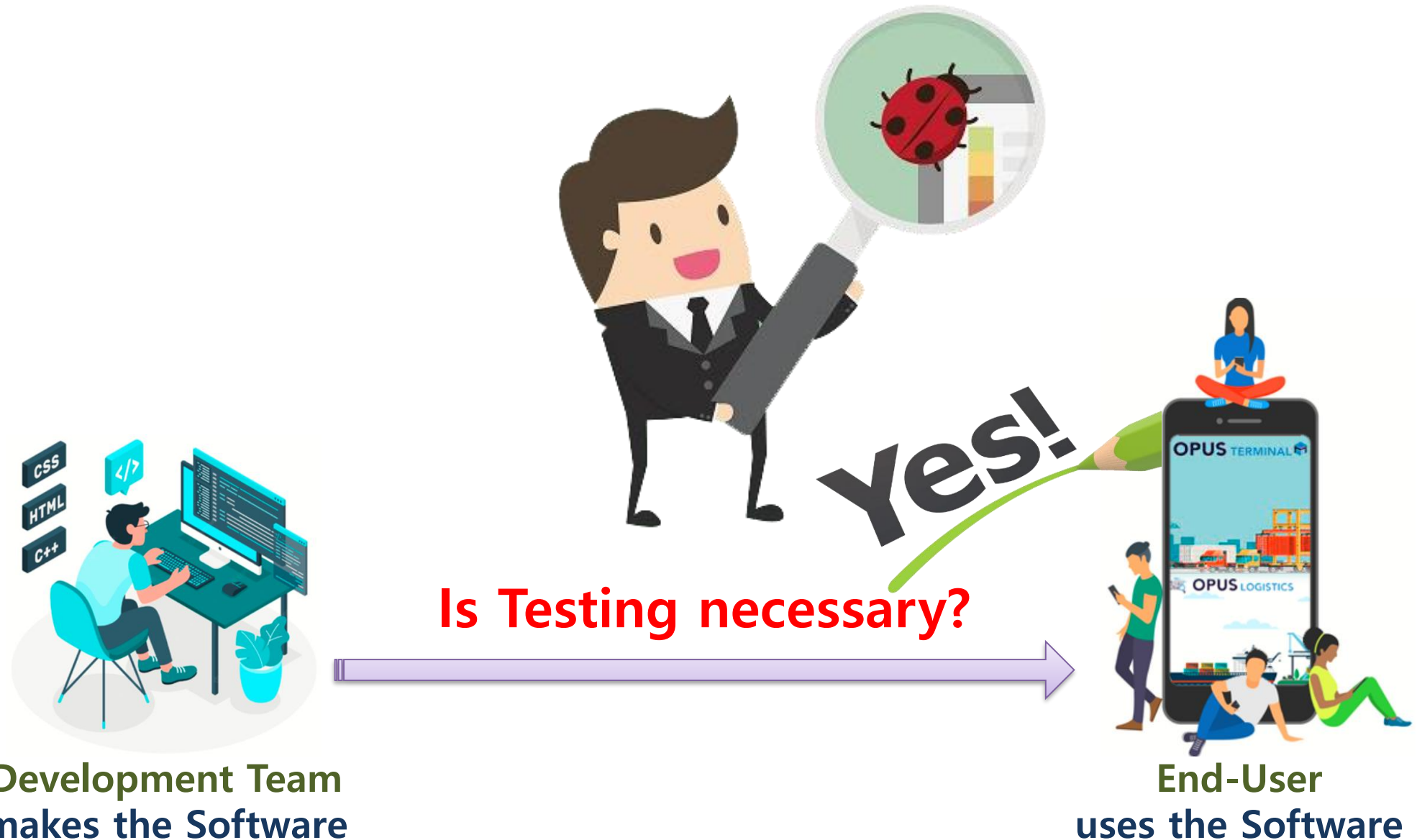
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Why is Testing necessary



Why is Testing necessary

TRANG CHỦ | TIN TỨC TRONG NGÀY

Chính trị - Xã hội | Đời sống - Dân sinh | Giao thông - Đô thị | Nông trên mạng | Vaccin Covid-19 | Dự báo thời tiết | Toàn cảnh COVID-19 | Lịch vạn niên

Ô tô, xe máy “chôn chân” trước cổng sân bay Tân Sơn Nhất...vì phần mềm thu phí bãi xe trục trặc

Thứ Bảy, ngày 21/05/2022 22:43 PM (GMT+7)

CHIA SẺ

Các phương tiện xếp hàng dài, “chôn chân” ở khu vực lối ra vào sân bay Tân Sơn Nhất do trục trặc phần mềm kỹ thuật thu phí nhà giữ xe sân bay.

Sự kiện: [Tin gần](#)



Why is Testing necessary

Số hóa > Công nghệ

Thứ hai, 31/3/2003, 14:00 (GMT+7)

Sự cố tên lửa Patriot có thể do lỗi phần mềm

Sở Chỉ huy Trung ương Mỹ cho biết quân đội nước này đang điều tra khả năng lỗi phần mềm đã khiến hệ thống tên lửa [Patriot](#) bắn nhầm máy bay của Anh. Tuy nhiên, họ không loại trừ những nguyên nhân khác.



Tên lửa Patriot tại căn cứ Ali Al-Salem.

Ngày 23/3, tên lửa Patriot ở biên giới Kuwait đã bắn nhầm máy bay chiến đấu Tornado GR-4 của không quân Hoàng gia Anh bay từ Iraq về, khiến 2 phi công thiệt mạng.

Ngày 24/3, máy bay chiến đấu F-16 của Mỹ buộc phải phá hủy hệ thống radar của Patriot sau khi viên phi công thấy tên lửa "nhắm vào" mình. Cả khẩu đội Patriot đã phải chạy trốn đạn pháo của F-16. Lúc đó, Patriot hoạt động "gần như tự động".

Ngày 25/3, tờ Washington Post trích lời một quan chức giấu tên của Lầu Năm Góc nói rằng nguyên nhân gây ra tai nạn nói trên "rõ ràng là do lỗi phần mềm điều khiển hệ thống tên lửa". Website của Đài phát thanh Australia cũng dẫn lời một sĩ quan không quân Hoàng gia Anh rằng phần mềm đã xác định nhầm máy bay Tornado là tên lửa của Iraq.



Why is Testing necessary

Forwarding v4_ITO [Software] / OPVFOUR-8204
[AWS5] [Urgent] Print issue

Type: Incident
Priority: Urgent
Status: REVIEW (View Workflow)
Resolution: Unresolved
Fix Version/s: Ver. 470.08

Assignee: Logistics Helpdesk
Reporter: Logistics Helpdesk
Original Requester: Logistics Helpdesk
PIC: 김
PIC(AA): Tran Van Tien
PIC(CLV): Tran Van Tien

Created: 2022-07-14 11:19
Updated: 2022-07-14 20:01
Planned Start Date: 2022-07-14 10:30
Planned End Date: 2022-07-29 12:54
Actual Start Date: 2022-07-14 10:30

Estimated: 10h
Logged: 1.5h

View on Board

Slack

In order to see discussions, first confirm access to your Slack account(s) in the following workspace(s): MTOS, CyberLogitec EMS, IBIS Plus, Next Logistics, QIT_Cyberlogitec, TOS Maintenance

Details

Type: Incident
Priority: Urgent
Affects Version/s: Ver. 470.08
Component/s: None
Labels: None
L1 Category: Problem
Deploy Request: Not Deployed
Evaluation: NA
Customer: Forwarding
Organizations:
Customer Ticket No: FWSD-816
Internal Watchers: Tran Van Tien, Nguyen Huu Vi, Logistics Helpdesk, Yew Lim,

Description

(1) Customer Company: AWS5 (Great Luck, C&L...)
(2) User Name: Komi
(3) E-Mail: mi@great-luck.com
(4) Reported: Zendesk#7950
(5) Priority: Urgent
(6) Program Category: IN
(7) Module Name: Ocean Import > House B/L > OIH B/L List > Print D/O Accounting> Operation> Invoice List
(8) Description:
Hi Dev Team,
The AWS5's customers are having the print issue.
We've tried to restart the tomcat but the issue still remains.
Please help us check and fix it.
Thank you.

Forwarding v4_ITO [Software] / OPVFOUR-8204

[AWS5] [Urgent] Print issue

Incident

Urgent

REVIEW (View Workflow)

Unresolved

Ver. 470.08

Logistics Helpdesk

Assign to me

Logistics Helpdesk

Logistics Helpdesk

김

Tran Van Tien

Tran Van Tien

2022-07-14 11:19

2022-07-14 20:01

2022-07-14 10:30

2022-07-29 12:54

2022-07-14 10:30

10h


1.5h

View on Board

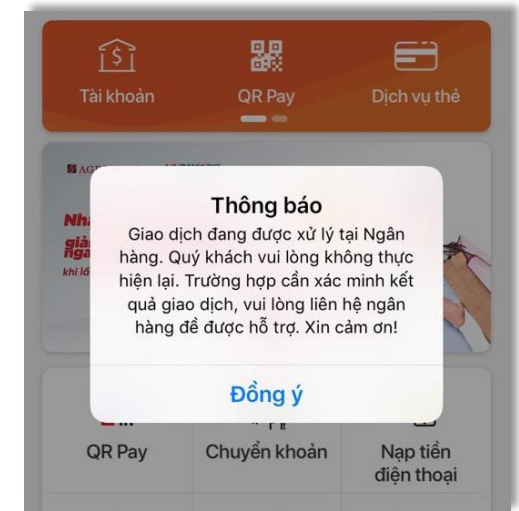
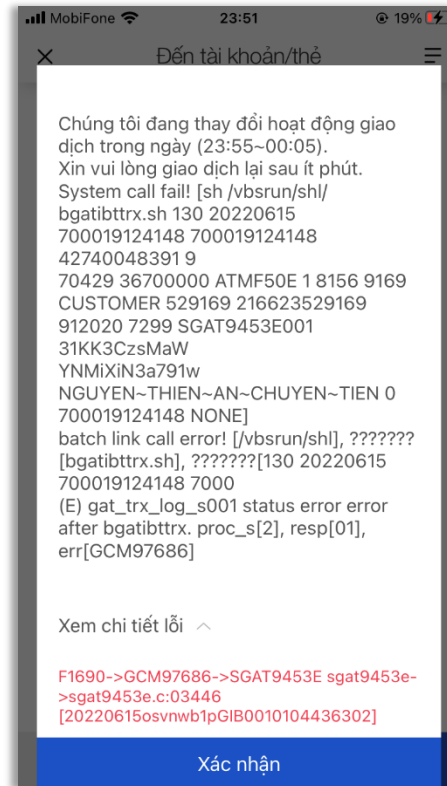
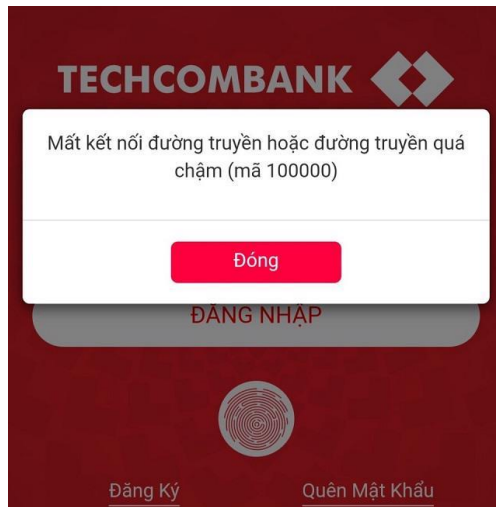
Slack

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Hi Dev Team,
The AWS5's customers are having the print issue.
We've tried to restart the tomcat but the issue still remains.
Please help us check and fix it.
Thank you.



Why is Testing necessary



Why is Testing necessary

The important reasons as to why software testing must be considered mandatory

- To gain customer confidence
- To check software adaptability
- To identify errors
- To accelerate software development
- To avoid risks
- To avoid extra costs
- To optimise business



Objectives of Testing

The Objective of Testing a Program is to Find Problems

Finding problems is the core of your work.

The more serious the problem tester finds, the better tester is.



Objectives of Testing

The Purpose of Finding Problems is to Get Them Fixed

The point of the exercise is quality improvement!

The best Tester is not the one who finds the most bugs or who embarrasses the most programmers.


The best Tester is the one who gets the most bugs fixed.



Objectives of Testing

EXAMPLE

Description	Steps	Actual	Expected	Remark
The data cannot be saved successfully	Precondition: 1/ Select Company name = Cyberlogitec Global Steps: 1. Open: Location screen 2. Click on Add button 3. Input valid data into the required fields 4. Select State Code = HANOICCITY 5. Click on Save button	The data cannot be saved successfully	The data should be saved successfully	The issue only occurs when users select the State Code, which has more 2 characters. If users select the State Code, which has 2 characters. The data can be saved successfully.

**Dat Pham**

Jun 22, 2022 | 17:44

• SUBMITTED: *Implementation*

Dear Mr. @annt
CC: Mr. @toandn , Mr. @dattn , Mr. @trungqn

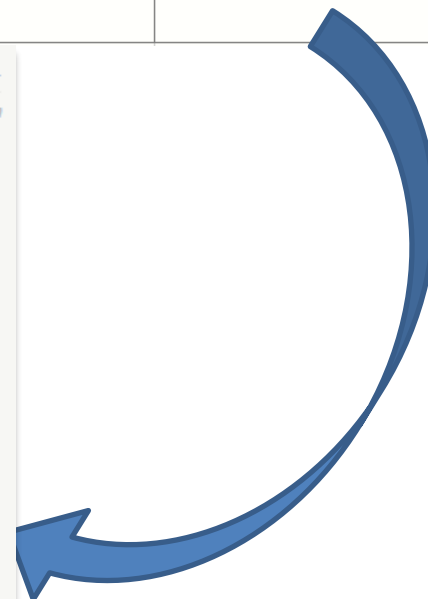
Thanks for your feedback.

I'd like to send you the result after I checked.
I have finished editing all suggestions according to your request.
About Issues #1: I updated from search Like one character to search like all character similar to Continent UI.

About Issues #2: Because the state field is saved in the database with only 2 characters instead of 10 characters like State UI. So need to update the database table => Please ignore this case temporarily until the table has been updated

Kindly help me check it

Thank you so much,
Dat Pham



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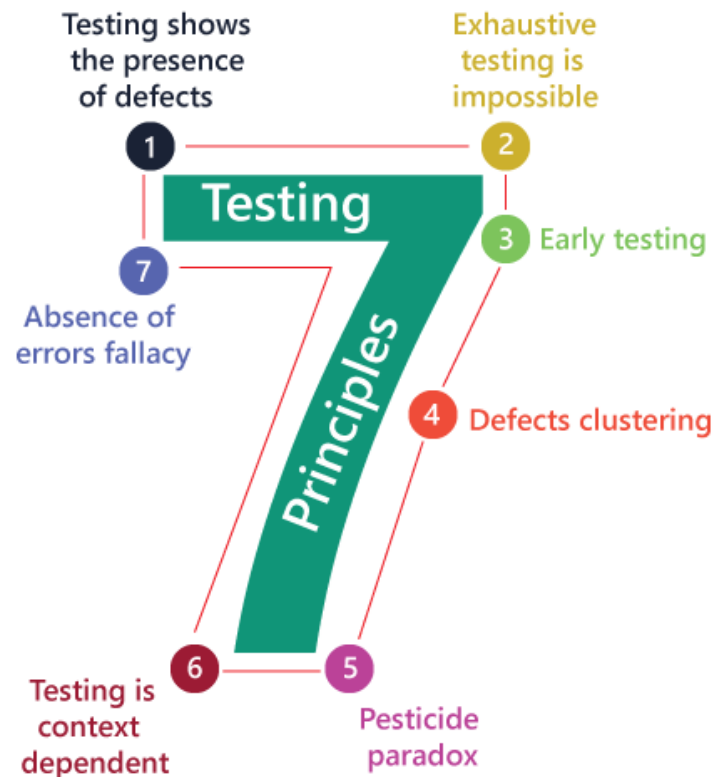
2.7 The Psychology of Testing

2.8 Manual Testing & Automated Testing

7 Testing Principles

What is principles?

The principle is rule/law
which has to be followed for developing the best system.



7 Testing Principles

#1. Testing shows the presence of defects

Testing is a process that shows the presence of defects in the application.

It shows the defects but cannot prove that there are no defects.

Meaning that the testing team cannot say that the product is 100% defect-free. It reduces the number of undiscovered defects in the application.

You cannot assume that the tested application is 100% error-free, even though testing is done. Therefore, design the needed test cases to find the defects as much as possible.



7 Testing Principles

#2. Exhaustive testing is impossible

There is less possibility of testing with combinations of inputs, data, test scenarios, and preconditions as they will take more time to test the process.

Because of this reason, test effects called risk and priorities are used to test important features.

So, accessing and managing risk is considered as the most important and essential activities for testing in any project.

- **Prevalence** – the proportion of people in a population who have a disease at a particular point in time
- **Incidence** – the proportion of people in a population who develop a disease over a period of time
- **Prevalence** = **Incidence** x **Duration**

#2. Exhaustive testing is impossible

EXAMPLE

Vessel Voyage Details
Inbound List
Inbound View
Port Of Discharge
Inbound Reconciliation

Vessel CSSC : SANTA CRISTINA 2022

Voyage 001 .UYIN001|QUYOUT001

☐ Select All ☐ Un-Reserve All

Operator Type

Commodity D/H

Class JobBay

Priority Size ☐ HC

POD Trade

Through Cargo

☒ Exclude TH.

☐ Include TH.

☐ Only TH.

Container List

	CHK	CNTR No.	Stowage	ISO	Class	OPR	OPR Name	F/M	POL	POD	POR	Weig...KG)	VGM(KG)	Location	Rail	Comm	Temp.	IMDC
1	<input type="checkbox"/>	QTES0000256	050690	20T1	II	CMA	CMA CGM S.A	F	CNQZH	CNQZH	KRBUS	5000	0		<input type="checkbox"/>	R	-5	
2	<input type="checkbox"/>	QTES0000260	050690	20T1	II	COS	COSCO CHINA OCEAN SHIP. CO	F	AEAHA	CNQZH	AEAHA	5000	0		<input type="checkbox"/>	R	-5	
3	<input type="checkbox"/>	QTES0000261	050690	20T1	II	CUL	CHINA UNITED LINES LTD	F	AEAJM	CNQZH	AEAJM	5000	0		<input type="checkbox"/>	R	-5	
4	<input checked="" type="checkbox"/>	QTES0000281	091290	20T1	II	BRA	BRITISH RHEIN ARMY	F	AEAJM	CNQZH	KRBUS	5000	0		<input checked="" type="checkbox"/>	R	-5	

Insert Rows

Number Of Rows

OK



Close

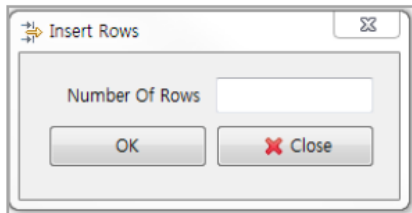
7 Testing Principles

#2. Exhaustive testing is impossible

EXAMPLE

Adding a row

1. Set the inquiry conditions, and click  [Search].
2. Click  [Row Insert].
3. When a pop-up window appears and prompts you to enter the number of rows to add, enter the number of containers, and click [OK].



Don't allow users to enter numbers greater than 1000 and less than 0

To test all cases, you would need more than 1000 numbers

But, timescales would never allow testing a large number of cases.

7 Testing Principles

#3. Early testing saves time and money

In this stage, testing activities will be conducted in the software to find the defects as soon as possible and to focus on defined objectives.

Testers can start testing the products if they have the availability of product requirements or documents.

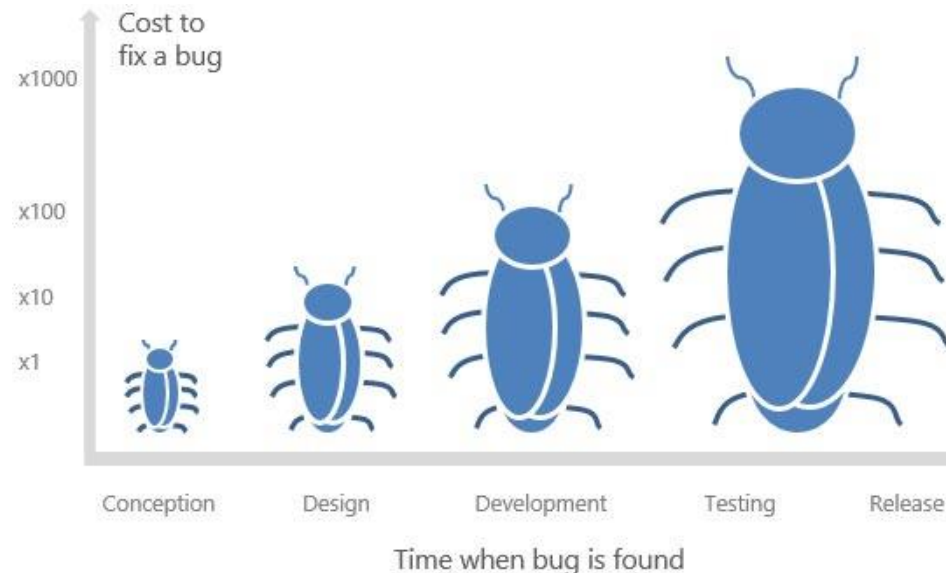
The main advantage of early testing is testers can easily detect errors, bugs and help in each level of development with fewer costs and efforts.

7 Testing Principles

#3. Early testing saves time and money

If errors are found in an initial stage of the development life cycle, then it will be easier and cheaper to fix, and also, the cost of quality will be less.

Otherwise, if they found late, then you need to change the whole system process.

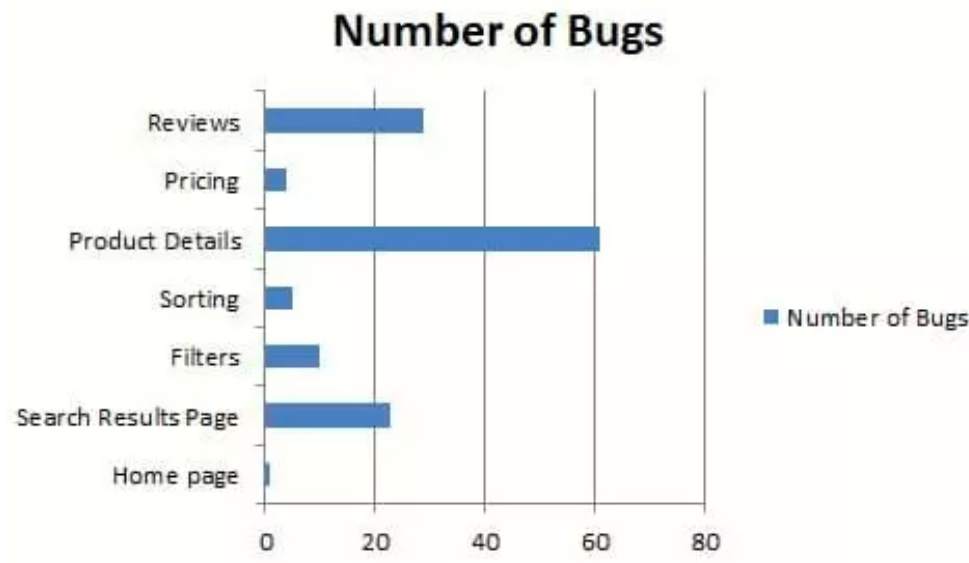


7 Testing Principles

#4. Defects cluster together

A small number of modules usually contains most of the defects discovered during pre-release testing or is responsible for most of the operational failures.

In the Pareto Principle application, software testing is approximately 80:20, which means 80% of the problems are found due to 20% of the modules.



7 Testing Principles

#4. Defects cluster together

EXAMPLE



OPUS Logistics™ for CYBERLOGITEC			
Sales	Operation	General/Admin	Banking
Ocean Export	A/R Invoice Entry	G&A A/R Invoice Entry	Deposit Entry
Ocean Import	A/P Invoice Entry	G&A A/P Invoice Entry	Deposit List
Air Export	Debit/Credit Entry	G&A Invoice List	Payment Entry
Air Import	Invoice List		Payment List
Inventory	Payment Verification		Payment History
Warehouse	Tax Invoice Entry		Deposit Lv2 Entry
Local Transport	Tax Invoice List		Deposit Lv2 List
Support			Payment Lv2 Entry
Accounting			Payment Lv2 List
Performance			Payment Lv2 History
Master Code			Payment Lv3 Entry
Administration			Payment Lv3 List
			Bank Batch Processing
			Bank Clear By Excel
			Bank Reconciliation
			Multi Bank Deposit/Payment Entry
			Multi Bank Deposit/Payment List

7 Testing Principles

#4. Defects cluster together

Defect clustering uses the knowledge and experience of the testing team to recognize the potential modules to test.

That forecast can help save time and effort as the team only needs to focus on those “sensitive” areas.

There is a small drawback of this phase when testers focus on a small area of the team; they may fail to miss the bugs from other areas.

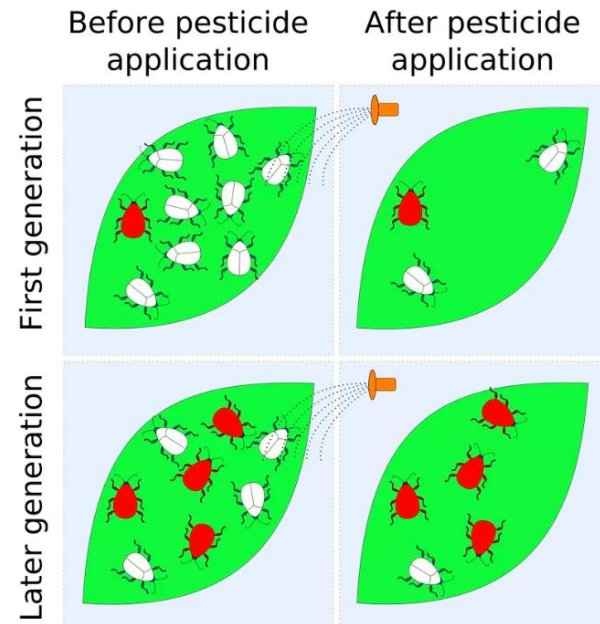
7 Testing Principles

#5. Beware of the pesticide paradox

If the same tests are repeated over and over again, eventually these tests no longer find any new defects.

To detect new defects, existing tests and test data may need changing, and new tests may need to be written.

Tests are no longer effective at finding defects, just as pesticides are no longer effective at killing insects after a while.



7 Testing Principles

#5. Beware of the pesticide paradox

EXAMPLE

Testcase 1: Fill in the textbox by Inputting from the keyboard



Update



Testcase 2: Fill in the textbox by using "Copy – Paste"



7 Testing Principles

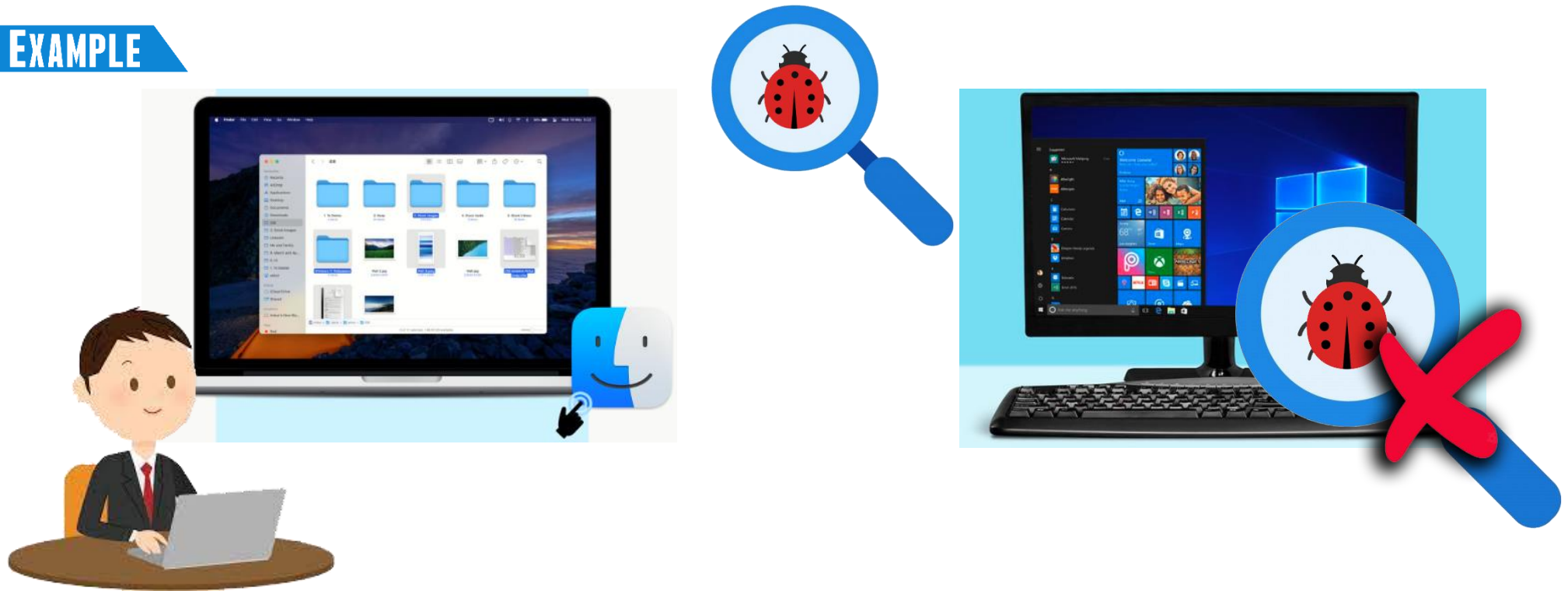
#6. Testing is context dependent

Testing is basically content dependent.

Projects and Products include different elements, features, and requirements.

In this approach, different types of sites can be tested differently, and the same test cases cannot be applied for different projects.

EXAMPLE



7 Testing Principles

#7. Absence-of-errors is a fallacy

Some organizations expect that testers can run all possible tests and find all possible defects, but principles 2 and 1, respectively, tell us that this is impossible.

Further, it is a fallacy to expect that just finding and fixing a large number of defects will ensure the success of a system.



7 Testing Principles

