# **IT Helpdesk for the Ministry of Justice**

W.G.D.P.C. Wijesinghe 2023



# IT Helpdesk for The Ministry of Justice

# A dissertation submitted for the Degree of Master of Information Technology

# W.G.D.P.C. Wijesinghe University of Colombo School of Computing 2023



#### Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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Mr./Ms. W.G.D.P.C. Wijesinghe under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

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Majesingly\_

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#### ABSTRACT

The Ministry of Justice has established to implement constitutional reforms to lawfully protect the people.

IT Division of the ministry of justice basically responsible for the installation and maintenance of computer network systems, maintenance IT related equipment, managing databases of the ministry and other related institutions. Furthermore, division is responsible for managing the Ministry's website and providing technical support for the meetings held at the Ministry of Justice.

'IT help desk' to the Ministry of Justice help related institutions as well as the employees of the ministry to online submit equipment repair requests, network configuration issues, databases problems real-time to the IT Division of the ministry of Justice.

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## **1. INTRODUCTION**

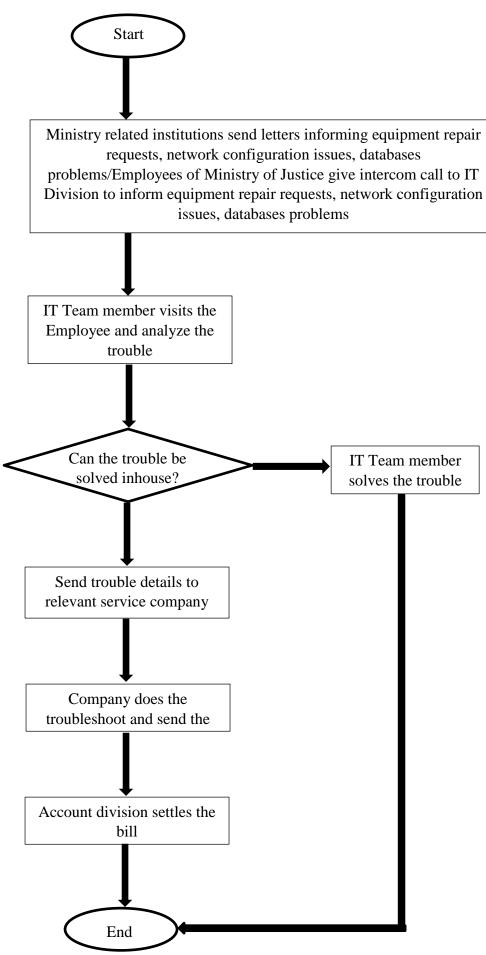
This report is an outcome of the thesis study of the Master of Information Technology program being held by University of Colombo School of Computing. Writer is the ICT officer at the Ministry of Justice Sri Lanka. The motivation for developing this 'IT help desk' is to address current issue faced by the IT unit at the Ministry of Justice.

IT Division of the ministry of justice basically responsible for the installation and maintenance of computer network systems, maintenance IT related equipment, managing databases of the ministry and other related institutions. Furthermore, division is responsible for managing the Ministry's website and providing technical support for the meetings held at the Ministry of Justice.

'IT help desk' to the Ministry of Justice help related institutions as well as the employees of the ministry to online submit equipment repair requests, network configuration issues, databases problems real-time to the IT Division of the ministry of Justice.

#### 1.1 BACKGROUND OF THE EXISTING SYSTEM

IT division of the ministry of Justice per day receives 10-15 troubleshoot requests from ministry employees and other related institutions. Employees of ministry give call to the IT division through intercom and inform their IT related issues to the IT division. Other related institutions send letter to the IT unit of the ministry. Then a member of IT division visits to relevant institute or ministry employee and fix the problem. If troubleshoot cannot be done inhouse problem details are sent to relevant service company. Service company fixes the problem and relevant payment is done by the Account Division.



1.1 Work flow of existing manual system

#### 1.2 PROJECT OVERVIEW

'IT help desk' to the Ministry of Justice help related institutions as well as the employees of the ministry to online submit equipment repair requests, network configuration issues, databases problems real-time to the IT Division of the ministry of Justice.

In-charge of the IT division can view all the received requests and assign each of them to a particular IT team member. He /She can solve the issue and mark the status to done. In-charge of the IT division can monitor the time taken. Request submitter can submit their level of satisfaction to the system.

IT division can view equipment repair history.IT team member who solves the issue can put a comment which can be helpful in future when solving similar type of issue.

If the issue will not be solved by the IT team due to some reason (e.g., unavailability of required equipment, item is under its warranty period therefore it is unnecessary do the troubleshoot and etc.) service request status is marked as 'Assign to Offsite'. Account division is able to view the requests which are assigned to off-site and assign them to relevant service company. Once the repair is done relevant payment is done online by the Accounts division.

Whenever IT related equipment is purchased to the ministry details of the device should be entered to the system by the Supply division.

Equipment vise service history reports and IT team member performance reports can be viewed by the system.

#### 1.3 MOTIVATION

Motivation for this project are the drawbacks of the existing manual system.

Current repair requesting mechanism is severely informal. Related institutions send repairs to the ministry via a snail mail. It takes at least two three days for the process. Most of these letters contain unwanted details rather than the required once.

Employees in the ministry inform repair requests via an intercom call. Therefore, it is necessary to keep 1 IT team member at the IT unit only to answer intercom calls. He / She has to answer the phone and write down name of the employee, branch and the trouble.

Some employees just inform the trouble and end the conversation without mentioning their identity or branch, some only mention the trouble and branch. In such situations IT team face difficulties in finding where the troubled device is.

Most of these repair requests either from ministry's employees or from other institutes required details about the trouble are not mentioned. In such situations unrequired branch/related institute visits happen which is a waste of time. On the other hand, when IT team is unaware of the trouble and the device for which repair should be done, team fails to

send the most suitable team member to solve that particular trouble. Furthermore, when team is unaware of the trouble, team member who visits the branch/related institute fails to take the necessary devices and equipment (e.g., relevant software CDs, network cables and etc.) needed at the first visit.

For doing certain repairs it is necessary to know the repair history of that particular device, in this manual system It is impossible to find the device repair history unless team members can memorize it (Which is a critically unstable method).

Furthermore, in this manual system Head of the IT team, does not have a proper method to evaluate the performance of each IT team member. On the other hand, IT team members does not have proper evidence to prove the workload covered by the IT team to the management level due to unavailability of records.

#### 1.4 OBJECTIVES

Objective of this project is to reduce the informality of current manual system.

Introducing proper monitoring system to IT team, having improved resource planning optimizing capabilities and efficiency of the IT team, reducing device repair misses, providing self-evaluation method to IT team members, providing proper evidence about the productivity of IT team to the staff officers when required are also expected

Furthermore, System will enable to prioritize highly sever repairs when there is a huge list of remaining repairs.

In addition, graphical representation of the daily, monthly and yearly productivity of each team members, and providing summary reports are expected.

#### 1.5 BACKGROUND

This system is developed for the Ministry of Justice.

Related institutes to the Ministry of Justice are as below.

- ✓ Attorney General's Department
- ✓ Legal Draftsman's Department
- ✓ Department of Debt Conciliation Board
- ✓ Department of Government Analyst
- ✓ Office of the Registrar of the Supreme Court
- ✓ Law Commission of Sri Lanka
- ✓ Superior Courts Complex Board of Management
- ✓ Legal Aid Commission of Sri Lanka
- ✓ Mediation Boards Commission
- ✓ Council of Legal Education
- ✓ Department of Public Trustee
- ✓ Commercial Mediation Centre of Sri Lanka
- ✓ Sri Lanka International Arbitration Centre (Guarantee) Ltd.
- ✓ Office for National Unity and Reconciliation
- ✓ Office on Missing Persons
- ✓ Office for Reparations
- ✓ National Authority for The Protection of Victims of Crimes and Witnesses

Divisions inside the Ministry of Justice are as below.

- ✓ Administration Division
- ✓ Legal Division
- ✓ Reforms Division
- ✓ Development Division
- ✓ National Integration Division
- ✓ Accounts Division
- ✓ Engineering Division
- ✓ Planning Division
- ✓ Internal Audit Division
- ✓ IT Division

#### 1.6 SCOPE OF THE PROJECT

#### Employee of the ministry/ Other related institutions

- a. Reports the trouble of their device(laptop/desktop/printer/photocopier) to the IT team through the system. Following details should be filled.
  - I. Employee name(mandatory)
  - II. Branch(mandatory)
  - III. Designation
  - IV. Serial no of the device
  - V. Category of the device e.g., laptop, desktop etc. (mandatory)
  - VI. Trouble

#### In charge of the IT Team

- a. Assign repair requests to IT team members
- b. View performance reports generated by the system
- c. View individual team members equipment repair history
- d. View pending repair requests
- e. Search repair request history Head of the IT team can search the trouble shoot history of each device

#### IT Team member

- a. View assigned equipment repair requests
- b. View pending equipment repair requests
- c. When the repair is done the trouble status is changed to 'Done', if repair cannot be completed onsite status set to 'assign to offsite'.
- d. Search equipment repair history IT team can search equipment repair history of each device
- e. Add comments If the trouble solved IT team member can put a comment which can be useful when similar type of trouble occurs in the future
- f. View performance reports generated by the System

#### **Director IT**

a. View performance reports generated by the system

#### Accounts Division

- a. View offsite jobs Supply section can view the list of 'assign to offsite' troubles and assign them to relevant companies
- b. Once the repair is done payment can be done to relevant company online

#### Supply Division

- a. Add device details. Following details should be filled.
  - I. Serial no of the device
  - II. Category of the device e.g., laptop, desktop etc.
  - III. Brand of the device
  - IV. Model of the device
  - V. Purchased Date
  - VI. Warranty period
  - VII. Warranty end date
  - VIII. Seller (Company name)

#### 1.7 STRUCTURE OF THE DESERTATION

This dissertation is based IT Help desk for the Ministry of Justice project.

First chapter contains the background, motivation and objectives of the proposed system. Second chapter holds system requirements (Functional and Non-functional). Third chapter covers design architecture including UML diagrams. 4th chapter encloses Management Information System (MIS) report templates.  $5^{th}$ , the last chapter consists of testing and evaluation details. References and appendix have been included at the end of the desertation.

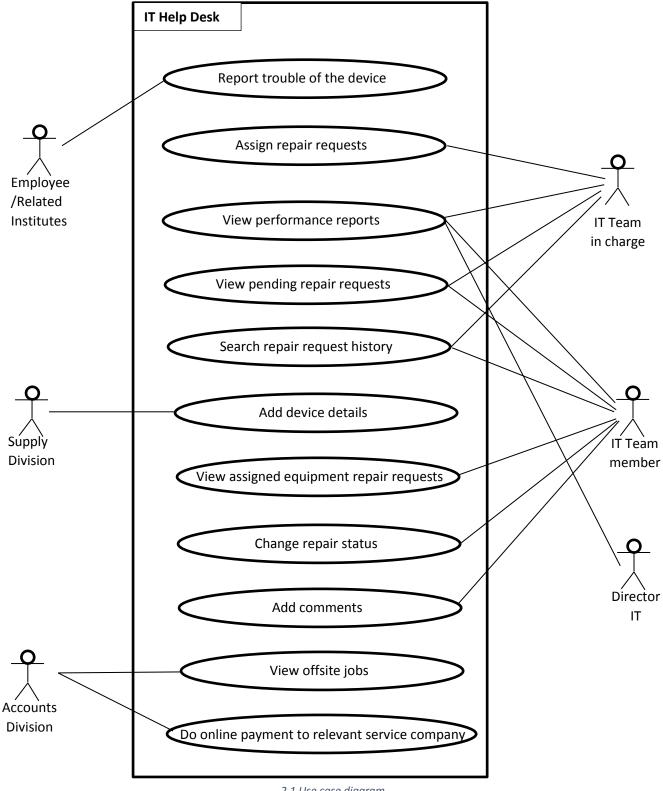
# 2. BACKGROUND

#### 2.1 INTRODUCTION

This chapter is about functional and nonfunctional requirement of the proposed system. Furthermore, this chapter draws attention to the previous studies or the existing similar systems and why those systems are not suitable for the expected situation. Finally related technologies are discussed.

#### 2.2 REQUIREMENT ANALYSIS

Requirement gathering is the first step of software development life cycle. This section lists functional and non-functional requirements of the expected system.



2.1 Use case diagram

#### 2.2.1 FUNCTIONAL REQUIREMENTS

Functional requirements of a software specify the features, capabilities, and behavior that the software must provide to fulfill its intended purpose. ("The IT Department: What They Do Vs. What Everyone Thinks They Do," n.d.) Functional requirements of the 'IT helpdesk' are as below.

- ✓ Employee should be able to submit repair request to the IT team
- $\checkmark$  IT team should be able to view submitted repair requests
- ✓ In charge of the IT team should be able to assign each submitted repair request to a particular IT team member
- ✓ IT team member should be able to change the status of submitted repair request to 'Done' once the job is done.
- ✓ If the repair cannot be done in-house IT team member should be able to change the status to 'Assign to offsite'.
- ✓ IT team should be able to view performance reports
- ✓ IT team should be able to search repair request history
- ✓ Accounts branch member should be able to view list of repair requests which are assigned to offsite
- ✓ Account branch should be able to do the payment to the relevant service company online

#### 2.2.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements of a software specify the qualities or characteristics that the software must possess, in addition to its functional requirements, to be considered effective and usable. These requirements describe how well the software performs its functions and how it meets certain quality attributes such as reliability, security, usability, performance, scalability, maintainability, and compatibility. ("Non-functional requirement," 2022). Non-functional requirements of the 'IT helpdesk' are as below.

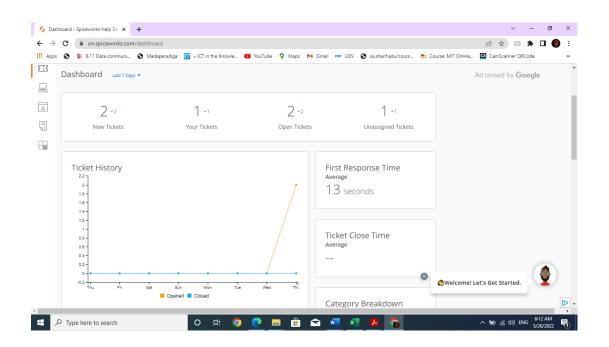
- ✓ User friendliness As system is used even by nontechnical people system should be easy to use. Otherwise, employees have tendency to give-up on the system and go back to manual system.
- ✓ Performance As system is used by general employee it should be developed in a way to quickly respond even in computes with basic technical requirements (E.g., 4GB RAM).
- ✓ Availability System should be perfectly available without down times specially in office hours (8.30 A.M. to 4.30 P.M.), Otherwise IT team may get complains.
- ✓ Reliability System should provide accurate details.
- ✓ Maintainability As the system is for long-term use system should be easily maintainable.

# 2.3 REVIEW OF SIMILAR SYSTEMS

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								8	Velcome! Let's Get Started.

2.2 Similar system reporting interface

This is a freely available IT helpdesk system in internet. In this system user has ability to create new repair requests and assign it to another user. Dashboard facility is also available.



2.3 Similar system dashboard

However, system doesn't match the requirements of the ministry. There are no user levels. All the users have the same privileges. Therefore, system becomes too complicated for a normal user who uses system just to submit a repair request.("Spiceworks," n.d.)

#### 2.4 RELATED TECHNOLOGIES

Technologies used for developing the 'IT Helpdesk' are as below.

- ✓ XAMP server Used to locally develop web-based system.
- ✓ MySQL For developing database
- ✓ PHP
   To communicate with database
- ✓ HTML

For developing interface of the system.

✓ CSS

CSS stands for Cascading Style Sheets. It is use to give system its look and layout.

✓ Java script

Used for developing client-side validations.

✓ AJAX

AJAX (Asynchronous JavaScript and XML) is a technique for creating fast and dynamic web pages. AJAX allows web pages to be updated asynchronously by exchanging small amounts of data with the server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.("Getting Started - Developer guides | MDN," n.d.)

✓ JQUERY

jQuery makes it much easier to use JavaScript on websites. jQuery reduces lines of JavaScript codes to a one line.("jQuery Introduction," n.d.)

✓ Bootstrap

Bootstrap is a free and opensource framework to develop front end in an attractive way easily. Core technologies used for this framework are HTML, CSS, and JavaScript. This facilitates creating responsive frontend development.

("What is Bootstrap? - Definition from WhatIs.com," n.d.)

# **3. DESIGN ARCHITECTURE**

#### **3.1 INTRODUCTION**

This chapter shows the design of the proposed system. It describes related design strategies, system architecture, UML diagrams.

### 3.2 RELATED DESIGN STRATERGIES

#### **Structured Design**

Structured design is a conceptualization of problem into several well-organized elements of solution. It is basically concerned with the solution design. Benefit of structured design is, it gives better understanding of how the problem is being solved. Structured design also makes it simpler for designer to concentrate on the problem more accurately.

Structured design is mostly based on 'divide and conquer' strategy where a problem is broken into several small problems and each small problem is individually solved until the whole problem is solved.

The small pieces of problem are solved by means of solution modules. Structured design emphasis that these modules be well organized in order to achieve precise solution.

These modules are arranged in hierarchy. They communicate with each other. A good structured design always follows some rules for communication among multiple modules, namely –

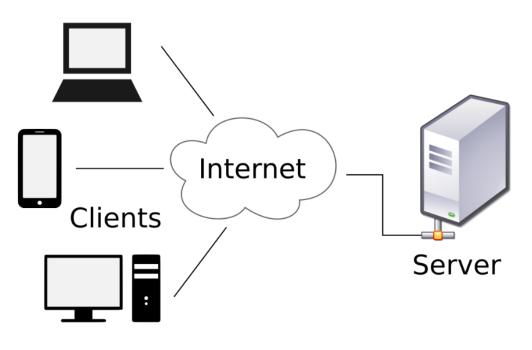
- Cohesion grouping of all functionally related elements.
- Coupling communication between different modules.

A good structured design has high cohesion and low coupling arrangements.

("Software Design Strategies," n.d.)

#### **3.3 SYSTEM ARCHITECTURE**

#### **Client-Server Architecture**



3.1 Client-server Architecture

("Client-server model," 2022)

Client-server architecture is a network architecture in which multiple clients (computing devices) request services and resources from centralized servers. In this architecture, clients and servers have distinct roles, with clients initiating requests for data or services and servers fulfilling these requests. This architecture allows for the efficient distribution of resources, processing and storage capabilities, and allows for clients to access the services and data provided by the server even when located remotely. Client-server architecture is widely used in distributed computing and is a fundamental concept in the design of many computer networks and applications, including the World Wide Web and enterprise-level business systems.("Client Server Architecture - CIO Wiki," n.d.)

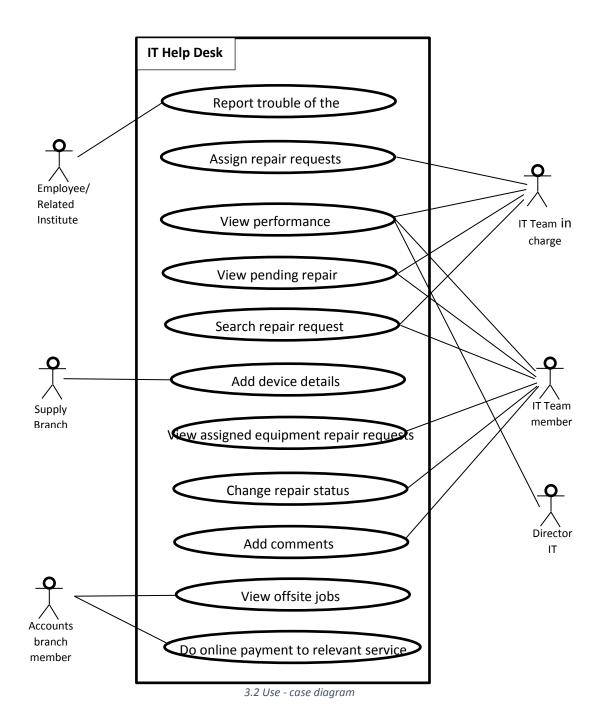
#### 3.4 UML DIAGRAMS

UML (Unified Modeling Language) is a standardized visual modeling language used to specify, visualize, and document the artifacts of software systems, including software architecture, data structures, algorithms, and business processes. UML provides a set of graphical symbols and notations that enable the representation of complex systems and relationships between software components. UML is widely used for software design and can be used to communicate design ideas, requirements, and constraints to stakeholders.

("All You Need to Know About UML Diagrams," 2018)

#### 3.4.1 USE-CASE DIAGRAM

A use case diagram is a type of behavioral diagram in Unified Modeling Language (UML) that illustrates the relationships between actors and use cases within a system. It is used to represent the interactions between actors (external entities that interact with the system) and use cases (representing specific actions or processes that the system performs). A use case diagram provides a high-level overview of the functional requirements of a system, and is typically used during the requirements gathering and analysis phases of software development. It is a visual representation of the functional requirements of a system and can be used to communicate the functional requirements of a system to stakeholders.



#### **USECASE NARRATIVES**

Table 3.1 Report trouble of the device

Use-case name	Report trouble of the device
Use-case ID	01
Primary Actor	Employee/Related Institute
Precondition	1. Internet Connection
Main flow	<ol> <li>Employee/related institute enter trouble details to the system.</li> <li>Employee/related institute click on the submit button</li> </ol>
Alternative flow	<ol> <li>Trouble details get entered to the system</li> <li>Employee/related institute enter invalid information in trouble details to the system.</li> <li>Employee/related institute click on the submit button.</li> <li>System prompts an error message.</li> <li>Employee/related institute has to correct the invalid information and click on submit button.</li> <li>Trouble details get entered to the system</li> </ol>
Post Condition	1. IT branch can view submitted trouble details

Table 3.2 Assign repair requests

Use-case name	Assign repair requests
Use-case ID	02
Primary Actor	IT team in charge
Precondition	1. Internet Connection
	2. IT team in charge should logged into the
	system
Main flow	1. IT team in charge view unassigned
	troubles
	2. IT team in charge assigns troubles to IT
	team members
Alternative flow	
Post Condition	1. IT team member can view assigned
	trouble details

Table 3.3 View performance reports

Use-case name	View performance reports
Use-case ID	03
Primary Actor	Director IT, IT team in charge, IT team
	member
Precondition	1. Internet Connection
	2. Actor should be logged into the system
Main flow	1. Actor can view reports
Alternative flow	
Post Condition	

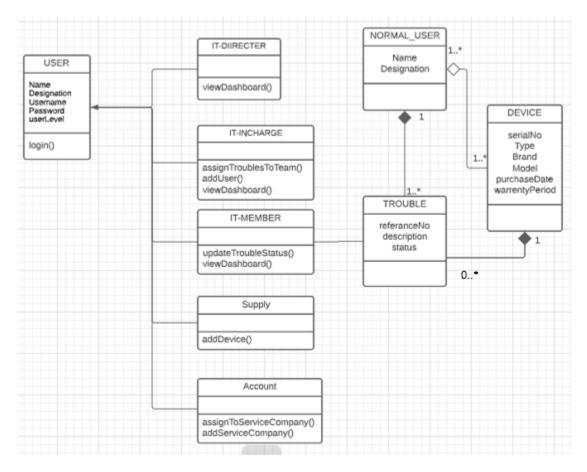
Table 3.4 Add device details

Use-case name	Add device details
Use-case ID	04
Primary Actor	Supply branch
Precondition	1. Internet Connection
	2. Actor should be logged into the system
Main flow	1. Supply branch enter new device details
	to the system.
	2. Supply branch click on the submit
	button.
	3. Device details get entered to the system
Alternative flow	1. Supply branch enter invalid information
	in device details to the system.
	2. Supply branch click on the submit
	button.
	3. System prompts an error message.
	4. Supply branch has to correct the invalid
	information and click on submit button.
	5. Device details get entered to the system
Post Condition	1. IT branch can view submitted device
	details

Table 3.5 View offsite jobs and do online payment to relevant service company

Use-case name	View offsite jobs and do online payment to
	relevant service company
Use-case ID	05
Primary Actor	Accounts branch
Precondition	1. Internet Connection
	2. Actor should be logged into the system
Main flow	1. Accounts branch view offsite jobs.
	2. Accounts branch do online payment to
	relevant service company.
Alternative flow	
Post Condition	

#### 3.4.2 CLASS DIAGRAM



3.3 Class diagram

#### SAMPLE USER INTERFACES

#### **Role: Normal User**

	DEVICE TROUBLE REPORT FORM
Reference No.	REF2
Name*	
Designation	Choose option $\sim$
Branch*	Choose option $\sim$
Device Serial No	
Device Category*	Choose option V
Phone No	
Trouble	//
REPORT	

3.4 Trouble reporting interface

# Role: IT - In charge

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3.5 Assign reported troubles to IT team member's interface

#### **Role: IT – Team Member**

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3.6 Change status interface

### **Role: Accounts branch officer**

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ew List dd New Service Company	Data Table	5											
	Show 10 v er	ntries										Search	υ.
	Reference No. ↑↓	Name ∿	<b>Designation</b> 1	Branch∿	Device Serial No. 🔨	Category∿		Phone No N	Date 1	↓ Assignee ↑↓	Service Company 🛝	Account No. 🛝	Assign to Service Company
	REF9	роо		Accounts		Desktop			2022-07-09 11:23:31	Choose option			Assign to Service Comp
	Reference No.	Name	Designation	Branch	Device Serial No.	Category	Trouble	Phone No	Date	Assignee	Service Company	Account No.	Assign to Service Company
	Showing 1 to 1 of 1	1 entries											Previous 1 N
l.													

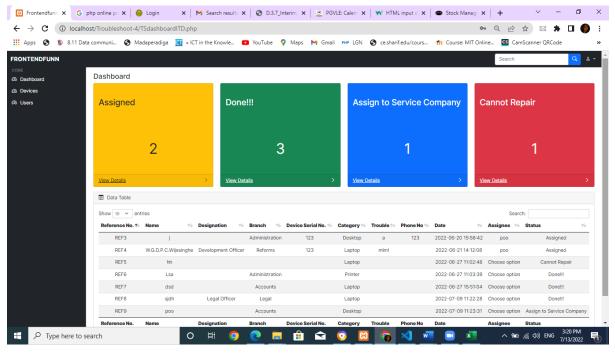
3.7 Assign to service company interface

								Search	Q 2
Add device	Add Device								
		Serial No.		Enter Serial No.	Тур	e of Device	~		
		Brand		Enter Brand	Mo	del	Enter Model		
		Purchase Date		mm/dd/yyyy	War	renty End Date	mm/dd/yyyy		
		Seller-Company		Enter Seller					
		Add Device							
	🖽 Data Table								
	Show 10 v entries							Search:	
	Timestamp	↑↓ Serial No.	↑↓ Type of Device	∿ Brand ∿	Model 🔨 Purchas	e Date 🛛 🗠 Warren	ty End Date 🔊 No Seller-Co	mpany 🔨 Updat	/Delete 🔿
	2022-07-10 09:55	:04 123	Laptop	tuv	t 2	022-07-11	2023-07-10	ухух Ц	pdate/Delete
	Timestamp	Serial No.	Type of Device	Brand	Model Purchas	e Date Warren	ty End Date Seller-Co	mpany Updat	/Delete

#### Role: Supply branch officer

3.8 Add device interface

#### **Role: IT – Director**

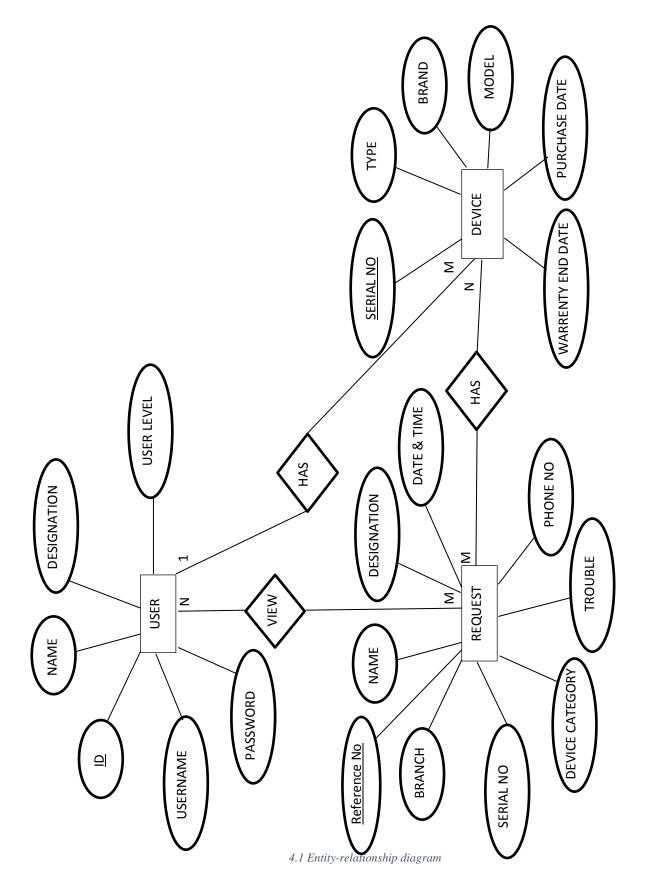


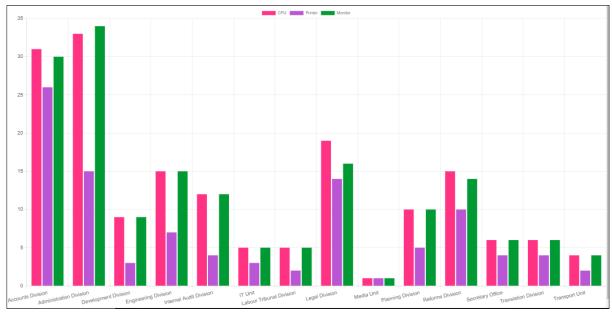
#### 3.9 Dashboard Interface

#### 3.5 ENTITY-RELATIONSHIP DIAGRAM

An ER diagram (Entity-Relationship diagram) is a graphical representation of entities and their relationships to each other, used in database design to illustrate an organization's data entities and relationships. It provides a visual representation of entities and the relationships between them, and is used to design and document database systems. An ER diagram helps to define data elements and relationships between entities, and can be used to design a database that effectively organizes and stores data.("Entity–relationship model," 2022)

4. MIS Report Templates





# 1. Branch wise device bar chart

4.2 Branch wise device counts report

# 2. Branch wise device counts report

Device List Search by:					Dov	vnload Excel File
	Device	CPU	~	Branch	IT Unit	~
Count = 5						
				Search:		

Ref.No ↑↓	Serial No. 🛝	Type of Device ↑↓	Brand	∿ Model	∿ Branch	$\uparrow \downarrow$
IT1	DTVJSSG00144606BBF9600	CPU	Acer	Vertion M	2630 IT Unit	
IT2	DUMMY2	CPU	Acer	Veritio	n IT Unit	
IT3	36008221A	CPU	Nec	MG33LBZEE	OVFSBZ IT Unit	
IT4	SGH725TPR2	CPU	HP	ProDesk 400	G4 MT IT Unit	
IT5	36008211A	CPU	NEC	MG33LBZEE	OVFSBZ IT Unit	
Ref. No	Serial No.	Type of Device	Brand	Model	Branch	

4.3 Branch wise device counts report

# 3. Trouble status summary report

Assigned			Do	ne!!!			Assign to S	ervice Com	npany (	Cannot Rep	bair
	2				3			2			0
<u>view Details</u>		>	View	<u> Details</u>		>	View Details		> 1	<u>riew Details</u>	
🖽 Data Table											
Show 10 v ent											
	tries									Search	к.
Reference		Designation	ſ↓	Branch ∿	Device Serial No. ∿	Category	y∿ Trouble ↑↓	Phone No ∿ D	ate 🔿		status
Reference		Designation Senior Assistant Se			No. ↑↓	Category	•	Phone No 🛝 D	ate 1		
Reference No. ↑↓	Name 🛝	-	ecretary		No. ↑↓ 12356784256		Doesn't turn on		2022-07-24	<b>↓ Assignee</b> ↑↓ itm	Status
Reference No. ↑↓	Name ↑↓ Wije	Senior Assistant Se	ecretary etary	Administration	No. ↑↓ 12356784256	Laptop	Doesn't turn on Sound issue		2022-07-24 23:22:43	<b>↓ Assignee</b> ↑↓ itm	Status Done!!! Assign to Service
Reference No. 1 2	Name ∿ Wije Wije	Senior Assistant Se Additional Secre	ecretary etary	Administration Administration	No. ↑↓ 12356784256	Laptop	Doesn't turn on     Sound issue     other selected	2	2022-07-24 23:22:43 022-07-26 08:23:5: 2022-07-26	Assignee 114	Status Done!!! Assign to Service Company



# 4. Device wise trouble & cost history reports

Device History Print this page	Serial No	).	Enter serial numb	er to get result	Search		
Serial No. Brand Purchase date Seller		12356784256 HP 2022-08-17		Type Model Warrent Branch	y end date		p -08-17 istration
Reference No.	Name	Designation	Trouble	Phone No	Date	Assignee	Status
1	Wije	Senior Assistant Secretary	Doesn't turn on		2022-07-24 23:22:43	itm	Done!!!
2	Wije	Additional Secretary	Sound issue		2022-07-26 08:23:59	itm	Assign to Service Company

4.5 Device wise trouble & cost history reports

# 5. TESTING AND EVALUATION

#### 5.1 RELATED TESTING TYPES

System went through lots of testing types through its development. Following are some testing types used.

- Sanity Testing
- Unit Testing
- Integration Testing
- System Testing
- Performance Testing
- Regression Testing

#### 5.2 TEST CASES AND RESULT

Table 5.1 Test cases

	Test					
Test	Case			Expected	Actual	<b>G</b> ( )
Scenario	ID	Test Case	Test Data	Result	Result	Status
	Check h	ome page navigations				
TS 1	1	Report Trouble page	Click on 'Report Trouble' link	Navigate to report trouble page	As expected	Pass
TS_1	2	Login page	Click on 'Login' link	Navigate to login page	As expected	Pass
	3	Home page	Click on home icon in 'Report Trouble' and 'Login' pages	Navigate to home page	As expected	Pass
	Check re	eport trouble functionality				
			1. Fields except 'Name'			
			2. Fields except 'Branch'			P
			3. Fields except			Pass
		Report Trouble	'Device Category'			
TS_2		without filling	4. Fields except	Error message	As	
10_2	4	mandatory fields	'Trouble'	should appear	expected	
		Report trouble with				
		wrong phone number	1.071-777-99999	Error message	As	Pass
	5	format	2. xxx-xxx-xxxx	should appear	expected	
		Report a trouble with		Data should be		
		all the fields filled		saved		D
		with any option other		successfully		Pass
	C	than 'other' selected as	1. Trouble='Doesn't	and success	As	
	6	'Trouble' field option	Turn On'	message should	expected	

			[	appear		
				uppeur		
				Data should be		
		Report a trouble with		saved		
		all the mandatory	1. Trouble='Other'	successfully		Decc
		fields filled with	2. Trouble	and success		Pass
		'other' selected as	Description='Sound	message should	As	
	7	'Trouble' field option	issue'	appear	expected	
	Check lo	ogin functionality				
			Correct username			
			& password			Pass
			1. username=dir		As	rass
			password=dir	Login	expected	
			Wrong username &			
			password			Pass
			1. username=inc		As	1 455
	8	Director Login	password=itm	Login Fail	expected	
			Correct username			
			& password			Pass
			1. username=dir	Login	As	
			password=dir Wrong username &	Login	expected	
			Correct password			
			1. username=itm		As	Pass
	9	IT in charge Login	password=inc	Login Fail	expected	
		11 in thingt 208in	Correct username	208		
TS_3			& password			D
			1. username=itm		As	Pass
			password=itm	Login	expected	
			Wrong username &			
			Correct password			Pass
			1. username=incitm		As	1 455
	10	IT member Login	password=itm	Login Fail	expected	
			Correct username			
			& password			Pass
			1. username=acc	Locin	As	
			password=acc	Login	expected	
			Wrong username &			
			Wrong password 1.			Pass
			username=accounts		As	1 455
	11	Accounts	password=itm	Login Fail	expected	
		1000 units	Correct username		- mpoolou	
			& password			D
			1. username=sup		As	Pass
	12	Supply	password=sup	Login	expected	
			· - •			

1	1	I	1	1	1	
			Wrong username &			
			Wrong password			_
			1.			Pass
			username=supply	T . D	As	
			password=supply	Login Fail	expected	
	Check fu	unctionalities of Director		1		
		Navigate and check				_
	10	accuracy of		Accurate	As	Pass
	13	'Dashboard' menu	'Dashboard' menu	'Dashboard'	expected	
		Navigate and check		Accurate		D
	1.4	accuracy of 'Device	Device Summary'	'Device	As	Pass
	14		menu	Summary'	expected	
		Navigate and check	Deries II'stand	<b>A 4</b> -	<b>A</b> -	Dere
TS_4	15	accuracy of 'Device	Device History'	Accurate	As	Pass
10_4	15	<u> </u>	menu	'Device History'	expected	
		Navigate and check	'Device Cost	Accurate 'Device Cost	As	Pass
	16	accuracy of 'Device		History'		Pass
	10	Cost History' menu Navigate and check	History' menu	View accurate	expected	
		accuracy of 'View		'Devices'		
		Devices' menu with	'View Devices'	according to	As	Pass
	17	filters	menu with filters	filters	expected	
	17	Navigate and check			expected	
		accuracy of 'Users'		Accurate '	As	Pass
	18	menu	'Users' menu	'Users'	expected	
	Check fi	unctionalities of IT in ch	arge			
		Navigate and check				
		accuracy of		Accurate	As	Pass
	19	'Dashboard' menu	'Dashboard' menu	'Dashboard'	expected	
		Navigate and check		Accurate	1	
		accuracy of 'Device	Device Summary'	'Device	As	Pass
	20	•	menu	Summary'	expected	
		Navigate and check		-	_	
		accuracy of 'Device	Device History'	Accurate	As	Pass
TS_5	21	History' menu	menu	'Device History'	expected	
		Navigate and check		Accurate		
		accuracy of 'Device	'Device Cost	'Device Cost	As	Pass
	22	Cost History' menu	History' menu	History'	expected	
			1. Assign selected			
			trouble to a IT team			
			member	Success		
			2. Update some	message should		Pass
			fields of a selected	be displayed		2 400
			trouble	and relevant		
		Navigate and check	3. Delete a selected	updates should	As	
	23	'Assign' menu	trouble	happen	expected	

	24	Navigate and check accuracy of 'View Devices' menu with	<ol> <li>Add new user</li> <li>Update a user</li> <li>Delete a user</li> <li>'View Devices' menu with filters</li> </ol>	Success message should be displayed and relevant updates should happen View accurate devices according to filters	As expected As expected	Pass Pass
	Check fu	unctionalities of IT mem	ber			
TS_6	26	Navigate to all the menus	<ol> <li>Dashboard</li> <li>Device</li> <li>Summary</li> <li>Device History</li> <li>Device Cost</li> <li>History</li> <li>Assigned to Me</li> <li>View Devices</li> </ol>	Should navigate to relevant menu	As expected	Pass
	27	Assigned to me	user='ITM'	Troubles assigned to that particular IT member should display and member should be able to change the status	As expected	Pass
	Check fu	unctionalities of Account	s branch			
	28	View list	View list	All the troubles in the status 'Assigned to Service Company should be displayed	As expected	Pass
TS_7	29	Assign to Service Company' menu	Trouble '5'	When the service company selected from drop down menu relevant account number should populate. User should be able to Assign	As expected	Pass

				trouble to a service company, Update, Delete.		
		Pay online function in 'Assign to Service		User should navigate to online transfer protocol of relevant bank's	As	Pass
	30	Company' menu	Click on pay button	website	expected	
	Check fu	unctionalities of Supply b	• • •			
TS_8			1. Add new device	Success message should be displayed and relevant		Pass
	31	Navigate and check 'Add Device' menu	<ol> <li>Update a device</li> <li>Delete a device</li> </ol>	updates should happen	As expected	

### 5.3 USER EVALUATION

Parameters used for evaluation are as below.

	Parameter
Functionality	Accuracy of reports
	Accuracy of data displayed
	Error messages
Security	Relevant page appears according to credentials
Usability	Screen are easy to navigate
	Data entry forms are easy to use
	Data validation is satisfactory
Performance	Response time
Appearance	User Interfaces are attractive
	Background colors and color combination matched
	Font face and size are compatible and readable

For user evaluation a google form was used. Users participated in the survey were as below.

User	Number of users
1. IT Director	01
2. IT in charge	01
3. IT team members	02
4. Accounts branch subject	01
clerk	
5. Supply branch subject clerk	01
6. Normal user	04
Total	10

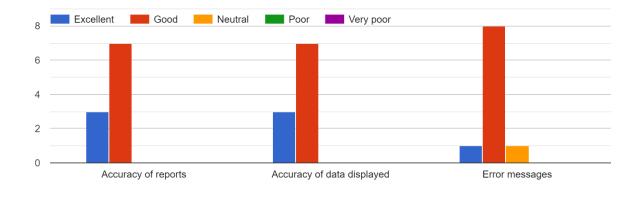
Table 5.3 Users participated in the survey

Co penanikawij	esinghe@gmail.c	com (not snar	ed) Switch acco	unt	¢
Functionality					
	Excellent	Good	Neutral	Poor	Very poor
Accuracy of reports	0	0	0	0	0
Accuracy of data displayed	0	0	0	0	0
Error messages	0	0	0	0	0
Security					
Relevant	Excellent	Good	Neutral	Poor	Very poor
page according to credentials	0	0	0	0	0
Usability					
Screen are	Excellent	Good	Neutral	Poor	Very poor
easy to navigate	0	0	0	0	0
Data entry forms are easy to use	0	0	0	0	0
Data validation is satisfactory	0	0	0	0	0
Performance					
	Excellent	Good	Neutral	Poor	Very poor
Response time	0	0	0	0	0
Appearapea					
Appearance	Excellent	Good	Neutral	Poor	Very poor
User Interfaces are attractive	0	0	0	0	0
Background colors and color combination matched	0	0	0	0	0
Font face and size are compatible and readable	0	0	0	0	0

5.1 User evaluation form

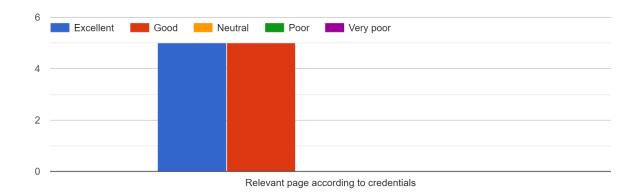
# User Response Summary

#### Functionality



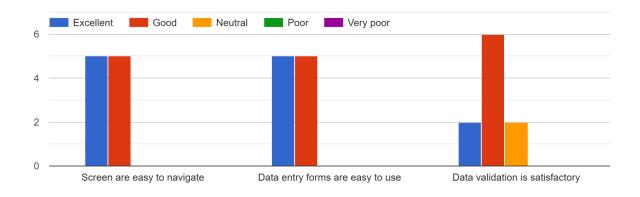
5.2 Functionality evaluation summary

Security

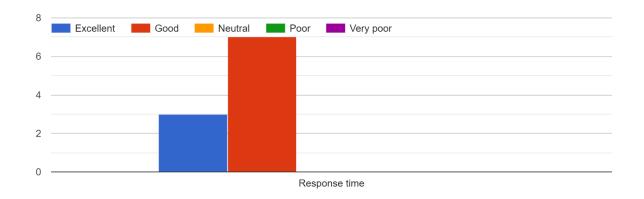


5.3 Security evaluation summary

#### Usability



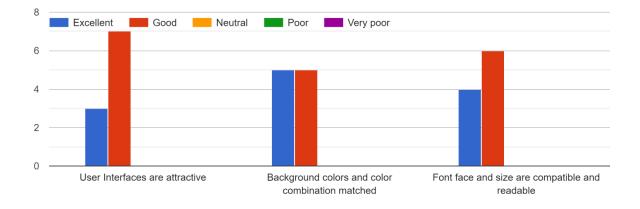
5.4 Usability evaluation summary



#### Performance

5.5 Performance evaluation summary

Appearance



5.6 Appearance evaluation summary

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# APPENDIX

# Current Progress / Refined Project timeline

01/10/2022     30/10/2022     30/10/2022     14/11/2022     14/11/2022       15/11/2022     30/11/2022     14/11/2022     14/11/2022       15/11/2022     30/11/2022     14/12/2022     14/12/2022       15/11/2022     30/11/2022     14/12/2022     14/12/2022       15/11/2022     30/11/2022     14/12/2022     14/12/2022       15/11/2022     30/11/2022     15/01/2022     15/01/2022       16/01/2022     30/01/2022     15/01/2022     15/01/2022       10/01/2022     31/07/2022     16/01/2022     16/01/2022       10/02/2022     31/07/2022     16/01/2022     16/01/2022       01/02/2022     31/07/2022     16/01/2022     16/01/2022       01/02/2022     31/07/2022     16/01/2022     16/01/2022				
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