

Assignment 2 – Server-side and database development: Part B and Part C

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Part B- Testing

Test number	Test title	Test Description	Predicted result	Actual Result	Fix
1.	Valid technician login	Log in with correct technician credentials Username: admin Password: heretohelp!456	The login will be successful, and the technician should be redirected to technician portal.	Login is successful, the technician is redirected to the portal and can see the incomplete requests. The technician can mark any incomplete requests as complete once completed.	N/A
2.	Valid staff login	Log in with correct staff credentials Username: staffmember Password: letmein!123	The login should be successful, and the staff member should be redirected to submit an inquiry on the IT request form.	The login is successful login. The staff member is redirected to the IT request form page and is able to submit a request.	N/A
3.	Invalid login	Log in with incorrect credentials	An error message should appear: "invalid username or password"	The error message is displayed: "invalid username or password", when the incorrect credentials are used.	N/A
4.	Empty login fields	Attempt log in with empty username and password field	Error message appears: "please fill out this field."	The error message "please fill out this field" appears and doesn't allow the user to log in.	N/A
5.	Redirect technician	Test technician login redirects to view jobs page	This should redirect the technician to technician-portal.php	The technician is redirected to the technician-portal.php.	N/A
6.	Redirect staff	Test staff login redirects to form to submit IT request	This should redirect the staff member to FormRequests.php	The staff member is redirected to the FormRequests.php	N/A
7.	SQL injection prevention	Test login form against SQL injection attacks Use '1' = '1' in the username field.	There should be no unauthorised access.	An error message stating invalid username appears.	Sanitize and use prepared statements for safe handling to achieve the correct message "no unauthorised access".

8.	Report IT request form validation	Test empty IT request form submission	An error message should appear.	Error message displayed" Please fill out this field".	N/A
9.	Successful IT request form submission	Test reporting an IT request by filling the form in with valid data.	The request submitted should be stored in the database successfully.	The request is stored successfully	N/A
10.	View incomplete jobs	Test technician viewing incomplete jobs	When the technician logs in, he/she should see a list of incomplete jobs.	The list of incomplete jobs is displayed on the technician portal.	N/A
11.	Complete job functionality	Test marking a job as complete	When the technician marks the job as completed, it should update successfully.	Job status updated successfully and completed jobs are removed.	N/A
12.	Session management	Test session variables for correct user role management. Ensure there is proper handling during login.	Proper session handling and there will be restricted access for unauthorised users.	Session managed correctly	N/A
13.	Form validation on client-side	Submit form with invalid data (client-side validation)	Form prevents submission and shows error	Form prevents submission and shows error.	N/A
14.	Form validation on server-side.	Bypass client-side validation and submit invalid data to ensure server-side validation prevents the submission.	Server-side validation prevents submission, and an error message appears.	Prevents submission and the error message does appear.	N/A
15.	Database connection error handling	Simulate connection failure	Error message "Database connection failed"	Error message appears stating the connection has failed.	N/A
16.	Database integrity	Test database for data integrity and relational consistency	No data anomalies present.	Data integrity maintained and there are no anomalies or incorrect data.	N/A

Part C – Critical Evaluation

The development of the IT request reporting system for Wear View Academy has several strengths and weaknesses, opportunities for further developments. This evaluation will provide a detailed analysis of the main strengths and weaknesses as well as explore suggestions for further improvements.

A key strength of the Wear View Academy login page is the user authentication. The login page has a user table that allows the system to successfully distinguish between the technician logging in and a staff member. This ensures that only authorised personnel can access and manage IT requests. This has been achieved by using PhpMyAdmin in the web space environment, through a simple login mechanism that validates credentials against a MySQL database. Another strength is the database design because it is efficient and well-organised, preventing the data entered being incorrect and ensures that data integrity is maintained. In addition, using foreign keys has enabled consistency between both, the users and job tables.

The Wear View Academy webpage has role-based redirection enabled meaning that when a staff member or admin logs in, they are redirected to another page based on their specific role. For example, a technician is directed to the technician portal where he/she can view and manage requests. Staff members are directed to the IT request form where he/she can report any IT issues. This improves user experience and ensures role-specific functionality.

Moreover, another strength of this system is job management (El-Ghazawi, T et, al. 2004). The technician can view a list of incomplete jobs when they first come in from the staff member and mark them as complete once the issue has been resolved. This part of the system is essential because it allows for efficient IT reporting and the technician can track the complete/incomplete jobs. Overall, this improves the IT support process for Wear View Academy. Also, both client and server-side validations are implemented in the form submission, ensuring the data entry is robust and prevents any invalid or malicious data from being stored in the database.

There are definitely some weaknesses in this IT request system for Wear View Academy and they need to be addressed to ensure the robustness and efficiency of the system. The log-in system for both staff members and technicians does not use session cookies, leaving the system vulnerable to unauthorised access or malicious take-over (Choi, Y., et, al. 2019). This can happen especially if session management has not been implemented. In these types of environments where sensitive and technical information is handled, having strong security protocols are vital to ensure data breaches are prevented and no unauthorised access is allowed.

The current authentication mechanism used in the system is basic and does not have the necessary advanced security features. The system relies solely on a simple username and password without the use of two-factor authentication or CAPTCHA, which are absolutely vital. Not having this additional security measure in place poses a big risk because it leaves the system open to data breaches (Coffin, D. 2011). Therefore, implementing two-factor

authentication and CAPTCHA can substantially improve the system's security by adding extra layers of protection.

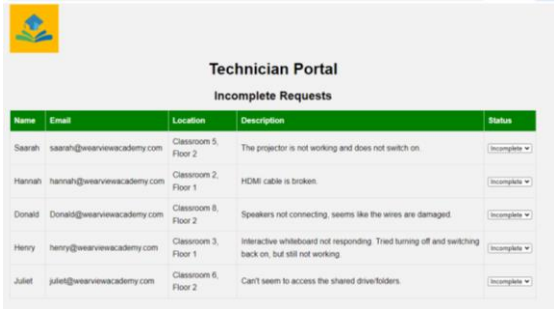
Additionally, there is some concern regarding the scalability and user experience of the current system. This current system works in a small-scale environment; however, it may struggle when the number of users and reported issues increase. This necessitates the implementation of indexing and having query optimisation so that larger datasets are handled more efficiently. Furthermore, the current user-interface is very basic and doesn't have modern design principles, making the system less user friendly. Improving this will enhance the user satisfaction and efficiency. Lastly, the system gives very minimal feedback to users when they encounter an error, therefore having comprehensive error handling and user-friendly messages are important to improve the overall user experience. Users should be able to navigate and use the system effectively without any confusion.

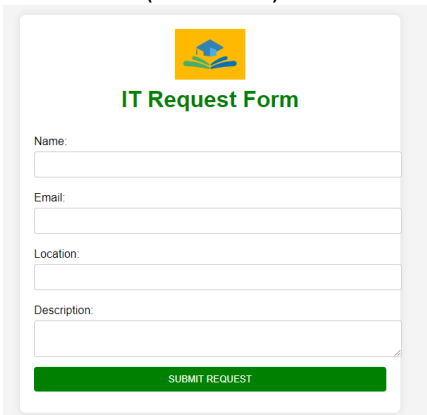
For future improvements, this IT request for Wear View Academy can be improved significantly by addressing some key areas. Firstly, implementing stronger security measures is crucial. The use of session cookies and a secure session management can stop any unauthorised access. The introduction of two-factor authentication and CAPTCHA during the log in process will provide extra layers of security and protection against malicious attacks (Choi, Y., et.al. 2019). All these measures will make sure that only authorised users can access the sensitive data and manage the technical issues.

The scalability of the system is an important part that requires attention. As the number of users and reported issues increases, the database queries need to be optimised and indexing should be introduced so that larger datasets are handled more efficiently. It may be necessary to transition to a more scalable database solution to maintain high performance levels. In addition, having a more responsive and modern design for the user interface will improve the usability and design. All this will enhance the overall user experience and make the system more user friendly.

Implementing comprehensive error-handling mechanisms and giving detailed user-friendly error messages will also improve user satisfaction. Providing clear feedback helps users understand and fix issues more effectively when accessing the system. Introducing logging and audit trails may also enhance security because user actions will be tracked, providing important insights into system usage and any potential issues. Lastly, integrating automated testing using tools like PHPUnit for end-to-end testing will ensure that the system stays robust and free of errors during any updates and enhancements. Overall, these suggested improvements will make the IT issue reporting system for Wear View Academy more secure, scalable, and user-friendly.

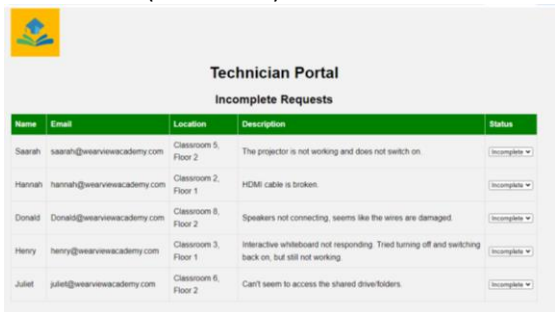
Appendix A

Test number	Test title
1.	Valid technician login
Actual result (screenshot)	
	

2.	Valid staff login
Actual result (screenshot)	
	

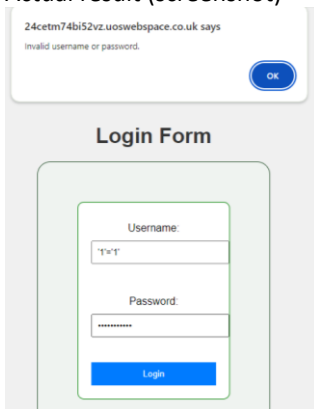
3.	Invalid login
Actual result (screenshot)	
	

4.	Empty login fields
Actual result (screenshot)	
	

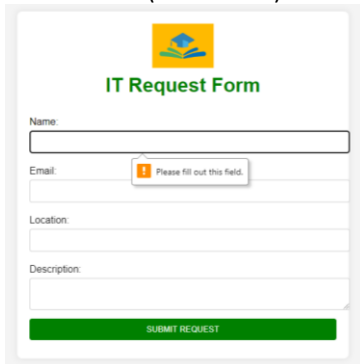
5.	Redirect technician
Actual result (screenshot)	
	

6.	Redirect staff
Actual result (screenshot)	
	

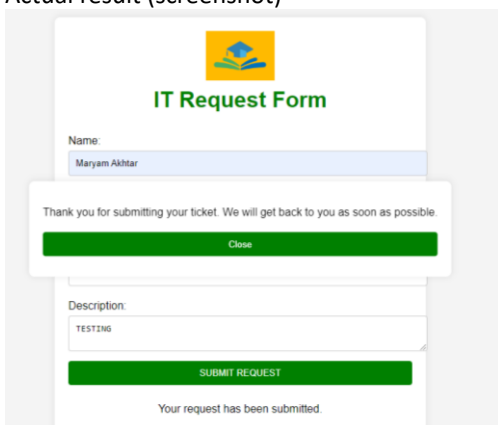
7.	Sql injection prevention
Actual result (screenshot)	



8.	Report IT request form validation
Actual result (screenshot)	




9.	Successful IT request form submission
Actual result (screenshot)	



10.	View incomplete jobs
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Actual result (screenshot)




Technician Portal
Incomplete Requests

Name	Email	Location	Description	Status
Sarah	sarah@wearviewacademy.com	Classroom 5, Floor 2	The projector is not working and does not switch on.	Incomplete
Hannah	hannah@wearviewacademy.com	Classroom 2, Floor 1	HDMI cable is broken.	Incomplete
Donald	Donald@wearviewacademy.com	Classroom 8, Floor 2	Speakers not connecting, seems like the wires are damaged.	Incomplete
Henry	henry@wearviewacademy.com	Classroom 3, Floor 1	Interactive whiteboard not responding. Tried turning off and switching back on, but still not working.	Incomplete
Juliet	juliet@wearviewacademy.com	Classroom 6, Floor 2	Can't seem to access the shared drive/folders.	Incomplete

11. Complete job functionality

Actual result (screenshot)



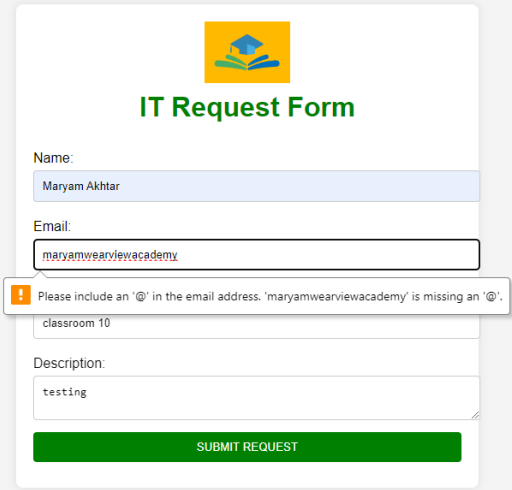
Technician Portal
Incomplete Requests

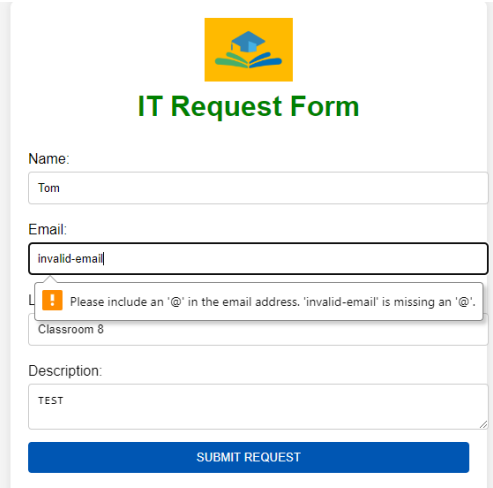
Name	Email	Location	Description	Status
Sarah	sarah@wearviewacademy.com	Classroom 5, Floor 2	The projector is not working and does not switch on.	Incomplete Incomplete Complete Incomplete
Hannah	hannah@wearviewacademy.com	Classroom 2, Floor 1	HDMI cable is broken.	Incomplete
Donald	Donald@wearviewacademy.com	Classroom 8, Floor 2	Speakers not connecting, seems like the wires are damaged.	Incomplete
Henry	henry@wearviewacademy.com	Classroom 3, Floor 1	Interactive whiteboard not responding. Tried turning off and switching back on, but still not working.	Incomplete
Juliet	juliet@wearviewacademy.com	Classroom 6, Floor 2	Can't seem to access the shared drive/folders.	Incomplete

12. Session management

Actual result

No unauthorised users can log in.

13.	Form validation on client-side
Actual result (screenshot)	
	

14.	Form validation on server-side.
Actual result (screenshot)	
	

15.	Database connection error handling
Actual result Error message: Database connection failed	

16.	Database integrity
Actual result (screenshot)	

phpMyAdmin

Recent

Favorites

WearViewAcademy

New

t_request

Server: localhost:3306 > Database: WearViewAcademy > Table: t_request

Browse

Structure

SQL

Search

Insert

Export

Import

Operations

Tracking

Triggers

SELECT * FROM `t_request`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all

Number of rows: 25

Filter rows: Search this table

Sort by key: None

+ Options

id

name

email

location

description

status

created_at

☐

Edit

Copy

Delete

1

Maryam

maryamakhtar897@hotmail.com

Birmingham

TESTING TESTING

Complete

2024-06-22 21:37:50

☐

Edit

Copy

Delete

6

Saarah

saarah@wearviewacademy.com

Classroom 5, Floor 2

The projector is not working and does not switch o...

Complete

2024-06-22 21:56:02

☐

Edit

Copy

Delete

7

Hannah

hannah@wearviewacademy.com

Classroom 2, Floor 1

HDMI cable is broken.

Incomplete

2024-06-22 21:57:15

☐

Edit

Copy

Delete

8

Donald

Donald@wearviewacademy.com

Classroom 8, Floor 2

Speakers not connecting, seems like the wires are ...

Incomplete

2024-06-22 21:58:15

☐

Edit

Copy

Delete

9

Henry

henry@wearviewacademy.com

Classroom 3, Floor 1

Interactive whiteboard not responding. Tried turni...

Incomplete

2024-06-23 13:42:23

☐

Edit

Copy

Delete

10

Juliet

juliet@wearviewacademy.com

Classroom 6, Floor 2

Can't seem to access the shared drive/folders.

Incomplete

2024-06-23 13:43:20

☐

Edit

Copy

Delete

11

Tom

tom@wearviewacademy.com

Classroom 4, Floor 1

TEST TEST

Incomplete

2024-06-23 14:06:12

☐

Edit

Copy

Delete

12

Maryam Akhtar

maryamakhtar@wearviewacademy.com

Classroom 9

TESTING

Incomplete

2024-06-23 14:06:47

Check all

With selected:

Edit

Copy

Delete

Export

References:

- El-Ghazawi, T., Gaj, K. and Alexandridis, N. (2004) *A performance study of Job Management Systems*, *Research Gate*. Available at:
https://www.researchgate.net/publication/262241349_A_performance_study_of_job_management_systems_Research_Articles (Accessed: 11 June 2024).
- Choi, Y., L, Y. and LaCroix, K. (2019) *Cookies and sessions: A study of what they are, how they can be stolen and a discussion on security*, *Research Gate*. Available at:
https://www.researchgate.net/publication/330828323_Cookies_and_Sessions_A_Study_of_what_they_are_how_they_can_be_Stolen_and_a_Discussion_on_Security (Accessed: 11 June 2024).
- Coffin, D. (2011) *Two factor authentication - researchgate*, *Research Gate*. Available at:
https://www.researchgate.net/publication/317580932_Two_Factor_Authentication (Accessed: 11 June 2024).