IN PARTNERSHIP WITH PLYMOUTH UNIVERSITY

Name:
Student Reference Number:

Module Code:	Module Name:
Coursework Title:	
Deadline Date:	Member of staff responsible for coursework:
Programme:	

Please note that University Academic Regulations are available under Rules and Regulations on the University website www.plymouth.ac.uk/studenthandbook.

Group work: please list all names of all participants formally associated with this work and state whether the work was undertaken alone or as part of a team. Please note you may be required to identify individual responsibility for component parts.

We confirm that we have read and understood the Plymouth University regulations relating to Assessment Offences and that we are aware of the possible penalties for any breach of these regulations. We confirm that this is the independent work of the group.

Signed on behalf of the group:

Individual assignment: ***I confirm that I have read and understood the Plymouth University regulations relating to Assessment Offences and that I am aware of the possible penalties for any breach of these regulations. I confirm that this is my own independent work.***

Signed :

Use of translation software: failure to declare that translation software or a similar writing aid has been used will be treated as an assessment offence.

I *have used/not used translation software.

If used, please state name of software……

Overall mark _____% Assessors Initials _____ Date_____

*Please delete as appropriate

1. Briefly explain global top 10 software defeats due to lack of testing

global top 10 software defects due to lack of testing

1. Grand Theft Auto – The Definitive Fiasco

- Cause: The game was released with bugs and poor design lead to negative impact.
- Impact: Damage to rockstar Games reputation
- Reason: Inadequate testing and rushed development.

2. T-Mobile data breach affects 50 million customers (March 18, 2021)
    - Cause: the mobile company reported that hackers had illegally accessed more associated customer names, addresses, dates of birth, phone numbers.
    - Impact: more than 50 million customer records have been stolen.
    - Reason:
        - Inadequate Security Testing: It was left to be determined that the breach emanated from inadequate security testing and monitoring of the systems belonging to T-Mobile. Breach occurred through the weaknesses that were not sufficiently tried on security loopholes in T-Mobile network.
        - Failure to Patch Vulnerabilities: Some of the breaches and trades may have not been passed appropriately or some security measures installed in critical areas of the organization's infrastructure may not have been properly set well by T-Mobile. This speaks volumes about the fact that there was little testing and monitoring that was done on systems for new discovered security threats periodically.

3. TikTok glitch resets followers to zero
    - Cause: Clear the cache of the TikTok app, as accumulated data may sometimes cause glitches
    - Impact:
        - Many people had an awful experience and switched to social media to voice out their grievances resulting to the creation of #TikTokDown.
        - Some users also reported issues with being able to use their accounts.
4. Amazon Partner Juspay Shamed Online - Data Breach Case
    - Cause: Juspay, the payment processor for companies like Amazon and Swiggy felt the heat recently when it lost about 3.5 crore records of customers that include masked card numbers and other information.
    - Impact: The breach compromised around 3.5 crore records, This data was later found for sale on the dark web, raising significant concerns about the security of customer information.

- Reason: The Juspay data breach occurred because threat actors exploited an unrecycled Amazon Web Services (AWS) access key.

5. Yahoo Confirmation on Massive Data Breach
    - Cause: Yahoo scandal involved state-sponsored hackers in the late 2014
      These hackers, who are suspected to be working with the Russian government hacked into the company's systems and stole details.
    - Impact:
        - User Impact: User Impact: The instance exposed the data belonging to 500 million users, including their names, email addresses and phone numbers, dates of birth, and hashed passwords
        - A major criticism levelled against Yahoo was that the company only revealed the cyber breach much later.
    - Reason: Yahoo data breach was as a result of state sponsored hackers affiliated to the Russian government.
6. Tesla recalls almost 12,000 vehicles
    - Cause:Tesla recently recalled nearly 12,000 vehicles in the U.S. due to a software communication error.
    - Impact: Then Tesla recall affects Model S, X, 3, and Y vehicles sold since 2017.
      & they had several impacts Tesla's finances, safety risks to drivers and passengers, Recalls can affect customer trust in the brand.
    - Reason: a communication error may cause a false forward-collision warning or unexpected activation of the automatic emergency braking system.
7. Toshiba also becomes victim of DarkSide
    - Cause: The Darkside ransomware attack on Toshiba's French subsidiary was caused by the exploitation of known vulnerabilities and possibly weak credentials.
    - Impact: Data Loss: Although Toshiba managed to contain the attack, they reported a minimal amount of work data was lost. Fortunately, no client data was accessed**.**
    - Reason: possibly weak credentials.
8. Slack receives backlash over new public DM feature
    - Cause: Slack received criticism when it announced the new feature known as Slack Connect DM since it permitted sending direct messages to anybody outside their firm This stirred outrage as it can result in harassment and abuse whereby users receive messages they did not bargain for from strangers.
    - Impact:
        - Reputation: It probably impacted Slack's image because the users started to doubt whether the platform safeguards them from unwanted messages.
    - Reason: because the new public DM feature allowed anyone to message users outs ide their organization.

9. Security Issues in Zoom App
    - Cause: Uninvited guests joint to the zoom meeting and do some inappropriate things.
    - Impact:
        - Financial Loss: Some companies did not allow people to use Zoom as an application for the communication which led to the direct loss of income from the subscription fee.
        - Operational Challenges: More time and efforts were needed to revoke user settings and integrate fresh security measures.
    - Reason:
        - Rapid Growth: This forced the development of new concrete security issues due to an increase in application users during the pandemic.
        - Encryption Misrepresentation: At the beginning, Zoom asserted it provided end-to-end encryption, which was partially true.
10. Log4j software bug leaves millions of web servers vulnerable
    - Cause: Log4j software bug leaves millions of web servers vulnerable.
    - Impact:
        - Data Theft: This weakness could be particularly inviting to attackers who could easily steal person data, passwords, and file from the affected systems.
        - System Compromise: The bad actors could take over systems with compromised configurations, and that includes backdoors for future use, tools for mining cryptocurrencies and ransomware.
    - Reason: Log4Shell, was caused by improper input validation.

2. the importance of Software Quality Assurance in modern software development. How does SQA contribute to the overall reliability and usability of software products?

the importance of Software Quality Assurance in modern software development

Software Quality Assurance plays a major role in modern software development. Use of a good SQA program makes it possible for companies to have tests on operating software while in the developmental stages, hence earlier identification of areas that have bugs and errors. Quality assurance also has some potentiality to enhance the UX design improvements that give a better user experience at the time of launch. By practicing SQA, the companies can produce more quality, reliable and innovative products that will increase a good reputation of the company brand.

- Having assisted companies in setting technical requirements for product quality.
- Creation of ways of evaluating product quality from the time of its concept to the final stages of production.
- To give feedback to the developers of the products being developed.

How does SQA contribute to the overall reliability and usability of software products?

Reliability

Product reliability is one of the main concerns with software quality, especially when it comes to systems failure results in severe ramifications, software can fail and lead to financial loss, company reputation, and even endanger users.

Software quality assurance engineering plays a central role in ensuring product reliability by:

- Compliance with Standards and Regulations: In many industries it is mandatory that all companies conform to the legal requirements of their particular business activity and industry standards.
- Early Detection of Defects: Developers and SQA engineers should collaborate at every stage in the system development process to detect and resolve deficiencies when they are still simple to fix.

Usability

Software Quality Assurance mostly use the usability because they wanted to give customer high standard of products. SQA identifies the problems and resolve defects early in development process to more useful and more accurate software products.

3. Explain the relationship between software faults, errors, and failures. How does effective testing help in minimizing the occurrence of these issues in software development?

the relationship between software faults, errors, and failures

Software faults mean failing in a software system that can lead to errors in its operation.

Software faults have various reasons such as design errors, coding errors, production failures or physical damage.

Software errors mean small mistakes that an unexpected outcome from a computer program or system.

Software errors cause human error, lack of qualification or skills, complexity of code and technology, poor documentation.

Software failures mean breakdown of any hardware, operating system, which prevents the accomplishment of work, even though the equipment may still be capable of operating properly.

Software failure cause could be crash of the software application or a system outage.

How does effective testing help in minimizing the occurrence of these issues in software development?

Identify bugs, failures, errors early that can reduce the cost and effort to fix those issues.

Ensuring Security testing can guard user data from exploited hackers or attackers.

Enhancing Usability can provide more user friendly and give more accurate software experience to the user.

These testing, developers can deliver high quality software products to the customer user

4. Discuss the role of Software Quality Assurance (SQA) in ensuring customer satisfaction in software development. How does an effective SQA process contribute to building customer trust and loyalty?

the role of Software Quality Assurance (SQA) in ensuring customer satisfaction in software development.

To customer satisfaction and maintain high quality and reliability by thoroughly testing and validating software SQA plays major role. Software Quality assurance check whole software development, software design source code control, testing part, do guarding of software quality, check every line in code to make sure no bugs and errors, SQA check in every user interaction because SQA need to make sure the output was very satisfied software.

When software quality assurance did not find out or miss any part of it, user face poor experience, High cost of software development and maintenance, can damage the organization reputation.

How does an effective SQA process contribute to building customer trust and loyalty?

1. **Define quality standards –** Directly communicating with customers ex: quick response, customer satisfaction.
2. **Training Organization employee –** to deliver quality customer service
3. **Review and improve quality –** Get feedback from customers and update continuously, set some goals and achieving the goals.
4. **Engage with customers –** Interact with customers regularly (Ex – Website, Mobile App, WhatsApp)

5. In your opinion, can 100% defect free software ever be achieved? Support your answer by discussing the limitations of software testing and the role of SQA in minimizing, rather than completely eliminating, defects

can 100% defect free software ever be achieved?

100% defects free software is an ultimate goal, but when it comes to practical way some of software limitations it is impossible to achieve.

the limitations of software testing

The limitations of testing software come from practical limitation, financial limitation, & time restriction.

The Key limitation of software testing

1. Incomplete Coverage
2. Impossible to test all conditions
3. Human Error
4. Cost and time constraints
5. Bias and assumptions
6. Time and resource constraints
7. Changing requirements

the role of SQA in minimizing, rather than completely eliminating, defects

Systematic Processes: SQA involves putting in place of systematic procedures in order to observe check and correct software development procedures from the following steps.

Early Detection: Hence, through frequent testing and reviews as facilitated by SQA, the defects are quickly detected in the early life cycle stages, Thus, enhancing the possibility of them not to be included in the final products

Continuous Improvement: SQA has built a culture that studies previous defects to avoid further occurrences of such in the future.

Compliance with Standards: SQA guarantees that the software development processes and products are being developed in the manner, which will minimize the probability of defects

References

1. global top 10 software defects due to lack of testing
   (Sharma, 2021; Sharma, 2021)https://www.bugraptors.com/blog/top-software-failures-due-to-lack-of-testing
   (Stojmanovska, 2021)https://www.testdevlab.com/blog/10-biggest-software-bugs-and-tech-fails-of-2021
2. the importance of Software Quality Assurance in modern software development
   (Kazeem, 2023) (Kazeem, The Crucial Role of Quality Assurance (QA) in Software Development, 2023)https://www.busyqa.com/post/the-crucial-role-of-quality-assurance-qa-in-software-development?form=MG0AV3
3. How does SQA contribute to the overall reliability and usability of software products?
   (DEV Community, 2024)https://dev.to/talenttinaapi/the-crucial-role-of-software-quality-assurance-engineering-in-ensuring-product-reliability-31h4#:~:text=By%20embracing%20the%20principles%20of,%2C%20trust%2C%20and%20organizational%20success.
4. SF faults
   https://www.google.com/search?q=what+is+software+faults&sca_esv=bc957982f2bbd7ba&sxsrf=ADLYWILkyMC7eikITnYu7cUPx6czWZmWqw%3A1729403436913&ei=LJoUZ-KwN4LAvr0P1KDrmQE&ved=0ahUKEwji9p7soZyJAxUCoK8BHVTQOhMQ4dUDCA8&uact=5&oq=what+is+software+faults&gs_lp=Egxnd3Mtd2l6LXNlcnAiF3doYXQgaXMgc29mdHdhcmUgZmF1bHRzMgQQIxgnMgUQABiABDIGEAAYFhgeMgYQABgWGB4yBhAAGBYYHjIGEAAYFhgeMgYQABgWGB4yBhAAGBYYHjIGEAAYFhgeMgYQABgWGB5I-g5Q0AZY0AZwAXgBkAEAmAHwAaAB8AGqAQMyLTG4AQPIAQD4AQGYAgKgAvoBwgIHECMYsAMYJ8ICChAAGLADGNYEGEeYAwCIBgGQBgmSBwUxLjAuMaAHoQc&sclient=gws-wiz-serp
5. SF errors
   (Whitney, 2024)https://firmbee.com/software-errors
   https://www.softwaretestingstuff.com/2007/10/software-errors.html#:~:text=Software%20errors%20are%20flaws%20that,software%20and%20its%20requirement%20specification.
6. Sf failure
   - https://www.google.com/search?q=what+is+software+failure+definition&sca_esv=c9b165f8b0051b14&sxsrf=ADLYWILc1WHUp_0DeNWk7FtCjp8AelUeDw%3A1729404945396&ei=EaAUZ-LyF8mcvr0PvKXPSA&ved=0ahUKEwiiv8W7p5yJAxVJjq8BHbzSEwkQ4dUDCA8&uact=5&oq=what+is+software+failure+definition&gs_lp=Egxnd3Mtd2l6LXNlcnAiI3doYXQgaXMgc29mdHdhcmUgZmFpbHVyZSBkZWZpbml0aW9uMggQABgWGB4YDzILEAAYgAQYhgMYigUyCxAAGIAEGIYDGIoFMgsQABiABBiGAxiKBTILEAAYgAQYhgMYigUyCBAAGIAEGKIEMggQABiABBiiBDIIEAAYgAQYogQyCBAAGIAEGKIESN5NUHRYy0twB3gAkAEBmAHpAaABohOgAQUwLjUuN7gBA8gBAPgBAZgCEqACshLCAgoQABiwAxjWBBhHwgINEAAYgAQYsAMYQxiKBcICCxAAGIAEGJECGIoFwgIGEAAYFhgemAMAiAYBkAYKkgcFNy40LjegB_tZ&sclient=gws-wiz-serp

   (GeeksforGeeks, 2024)https://www.geeksforgeeks.org/introduction-to-faults-in-software-engineering/#difference-from-error-and-failure

7. How does effective testing help in minimizing the occurrence of these issues in software development?
   (Hamilton, 2024)https://www.ibm.com/topics/software-testing?form=MG0AV3
8. the role of Software Quality Assurance (SQA) in ensuring customer satisfaction in software development
   - (What is Software Quality Assurance, 2024)https://www.lambdatest.com/learning-hub/software-quality-assurance
   - (V, 2024)https://www.fegno.com/quality-assurance-in-software-development/?form=MG0AV3
9. How does an effective SQA process contribute to building customer trust and loyalty?
   (linkedin, 2024)https://www.linkedin.com/advice/1/what-best-practices-building-customer-jfavf
10. sf testing limitation
    - (dev, 2024)https://dev.to/keploy/understanding-the-limitations-of-software-testing-4i49?form=MG0AV3
    - (MuukTest, 2024)https://www.linkedin.com/pulse/overcoming-limitations-software-testing-muuktest-yqeye/
    - (TestMetry, 2023)(TestMetry, 2023) (TestMetry, 2023)https://testmetry.com/testing-limitations/