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REG NO: FCP/CIT/18/1006

COURSE : CIT 407 MOBILE APPLICATION DEVELOPMENT

Chapter 3

MOBILE APP TESTING

Mobile app testing is the process of evaluating the functionality, performance, usability, security, and compatibility of a mobile application to ensure it meets quality standards before its release to end users.

It aims to ensure that the app delivers a seamless user experience and meets the desired requirements.

TYPES OF TESTING

1. Functional Testing
2. Performance Testing
3. Security Testing
4. Usability test
5. Network test

1. FUNCTIONAL TESTING

Aims to verify that every function of an app is working precisely as required. It focuses on testing user flows within the app and each feature comprising each user flow. Customers expect that each app will be flawless in its functioning.

2. Performance Testing

Performance testing measures the speed, responsiveness, scalability, resource usage, and stability of the mobile application. It ensures the app performs well under different scenarios.

3. Security Testing

Security testing focuses on identifying vulnerabilities and potential security risks in the mobile application

4. Usability Testing:

Usability testing evaluates the app's ease of use, intuitiveness, and overall user satisfaction. It involves real users performing tasks on the app to gather feedback and identify areas for improvement.

5. Network Testing

Mobile apps heavily rely on network connectivity. Network testing involves testing the app's behavior under different network conditions, such as switching between Wi-Fi and cellular data, handling network interruptions, and performance degradation in low-signal areas

DIFFERENT TYPES OF TESTING AND TOOLS USED IN TESTING PROCESS

1. Appium

 is a mobile application testing tool that is currently trending in Mobile Automation Testing Technology. Appium is used for automated testing of native, hybrid, and web applications. It supports automation test on the simulators (iOS) and emulators (Android) as well as physical devices (Android and iOS both).

2. UI Automator

UI Automator allows the user to interact with visible elements of the screen. In order to optimize testing, inspect the target app's UI components and ensure that they are accessible. Each element has certain characteristics, such as content-description, class, resource-id, text, etc.

3. JUnit

 is a unit testing open-source framework for the Java programming language. Java Developers use this framework to write and execute automated tests. In Java, there are test cases that have to be re-executed every time a new code is added

4. Load Runner

is a software testing tool from Open Text. It is used to test applications, measuring system behavior and performance under load.

5. Nessus

 is a platform developed by Tenable that scans for security vulnerabilities in devices, applications, operating systems, cloud services and other network resources.

These are just a few examples of testing types and tools used in the testing process. The selection of testing types and tools depends on the specific requirements, technology stack, and objectives of the project

WEEK 4:

MOBILE APP DEPLOYMENT

Mobile app deployment refers to the process of making a mobile application available for users to download and install on their mobile devices through app stores or other distribution channels.

THE MOBILE APPLICATION DEPLOYMEN T PROCESS TYPICALLY INVOLVES SEVERAL STEPS:

1. Development and Testing
   The development team creates the mobile app, and it undergoes rigorous testing to identify and fix any bugs or issues.

2. App Store Registration
   If you're planning to deploy your app on official app stores like Google Play Store for Android or Apple App Store for iOS, you need to register as a developer and set up an account.

3. App Submission:
   Prepare the necessary materials for submission, such as app metadata, screenshots, app icon, and descriptions. Then, submit your app to the respective app store for review.

4. App Review Process:
   The app store reviews your submission to ensure it meets their guidelines, including content policies and technical requirements. This review process can take several days to a few weeks.

5. Approval and Release:
   If your app passes the review process, it will be approved for release on the app store. Users can now find and download your app.

6. Post-Release Monitoring:
   Keep track of the app's performance, user feedback, and any potential issues that may arise after deployment. Regularly update your app to add new features and fix bugs.

7. Alternative Distribution Channels:
   Besides app stores, you can distribute your app through other channels like enterprise distribution, where you share the app directly with your employees or clients.

Remember that the process may vary depending on the platform, app store policies, and your specific requirements. Also, ensure you comply with legal and privacy regulations when deploying your mobile application.

DEPLOYMENT OF MOBILE APP TO THE GOOGLE PLAY STORE,

Involves follows these steps:

1. Create a Developer Account:

If you don't have one already, sign up for a Google Play Developer account. There is a one-time registration fee.

2. Prepare Your App:

Ensure your mobile app is fully developed, tested, and ready for deployment. Make sure it complies with Google Play's policies and guidelines.

3. Generate a Signed APK or App Bundle:

Build a signed APK (Android Package) or an Android App Bundle of your app. The latter is recommended as it allows Google Play to optimize the app for different device configurations.

4. Configure the Play Console:

Log in to your Google Play Developer account and access the Google Play Console.

5. Create a New App Listing:

Create a new app listing by providing details like the app's title, description, screenshots, promotional images, and video.

6. Upload the APK or App Bundle:

Upload the signed APK or App Bundle of your app to the Google Play Console.

7. Set Pricing and Distribution:

Choose whether your app will be free or paid and select the countries where you want to distribute the app.

8. Content Rating:

Fill out the content rating questionnaire to determine the appropriate age rating for your app.

9. App Release:

Decide whether to release the app immediately or use staged rollouts. Staged rollouts allow you to release the app to a percentage of users initially before a full release.

10. Review and Publish:

Submit your app for review. Google Play will check if your app meets their policies. Once approved, you can publish your app on the Play Store.

11. App Updates:

For future updates, you will follow a similar process, but you will increment the version code and update the APK or App Bundle.

Remember to carefully read and comply with Google Play's policies to avoid any issues during the review process. It may take some time for your app to become available on the Play Store after submission, so be patient.

TO DEPLOY YOUR MOBILE APP TO THE APPLE APP STORE, FOLLOW THESE STEPS:

1. Enroll in the Apple Developer Program:
   If you haven't already, enroll in the Apple Developer Program. This program is required to publish apps on the App Store.

2. Prepare Your App:
   Ensure that your mobile app is fully developed, thoroughly tested, and adheres to Apple's App Store Review Guidelines.

3. Create an App ID:
   In the Apple Developer Account, create an App ID for your app. This unique identifier is used to link your app to your developer account.

4. Generate an App Archive:
   Build an app archive of your app using Xcode. Ensure that the app archive is configured for distribution and is signed with a distribution provisioning profile.

5. Create an App Store Connect Record:
   Log in to App Store Connect, Apple's portal for app management, and create a new record for your app.

6. Provide App Information:
   Fill in details about your app, including its name, description, keywords, screenshots, app icon, and other metadata.

7. Set Pricing and Availability:
   Decide whether your app will be free or paid, and select the countries where you want it to be available.

8. App Review Information:
   Provide contact information for Apple's review team and any special instructions they may need to test your app effectively.

9. Submit for Review:

Once you have completed all the necessary steps, submit your app for review on App Store Connect.

10. App Review Process:
    Apple's App Review team will assess your app to ensure it meets their guidelines and policies. The review process can take several days.

11. App Approval and Release:
    If your app passes the review process, it will be approved for release on the App Store. You can then choose to release the app immediately or schedule a specific release date.

12. App Updates:
    For future updates, you will follow a similar process, incrementing the version number and updating the app archive

    Make sure to thoroughly test your app and provide accurate and complete information during the submission process. Complying with Apple's guidelines is crucial for a successful app review and deployment on the App Store.

WEEK: 5
MOBILE APP ANALYTICS
Mobile app analytics refers to the process of collecting and analyzing data related to the usage and performance of a mobile application. App developers and businesses use this data to gain insights into user behavior, app performance, and overall app success. The goal is to make data-driven decisions to improve the app's functionality, user experience, and achieve specific business objectives

Mobile app analytics tools like Google Analytics for Mobile Apps, Firebase Analytics (for Android and iOS), and other third-party solutions provide developers with the necessary insights and metrics to make informed decisions and continuously improve their app's performance.

Tracking and analyzing app usage data To achieve this:

1. Choose a suitable analytics platform like Google Analytics for Mobile Apps or Firebase Analytics.
2. Integrate the analytics SDK into your app and set up event tracking for key user actions.
3. Optionally enable automatic tracking or use custom parameters for additional context.

4. Test and debug the analytics implementation to ensure accurate data collection.

5. Comply with data privacy regulations and obtain user consent for data collection.

6. Regularly access the analytics dashboard to analyze user behavior and app performance.

7. Create reports and visualizations to present data in a meaningful way.

8. Use the insights to make data-driven decisions and improve your app's features and user experience.

mobile app analytics is crucial for understanding user behavior, enhancing user experience, making data-driven decisions, optimizing app performance, and measuring the success of your mobile application. It empowers app developers and businesses to stay competitive, retain users, and drive continuous improvements to meet user expectations and business goals.

WEEK 6

MOBILE APP SECURITY

Mobile app security refers to the protection of mobile applications from various threats, vulnerabilities, and attacks that can compromise the confidentiality, integrity, and availability of user data, as well as the overall functionality of the app.

BEST PRACTICES FOR SECURING DATA USER AND PROTECTING AGAINST MALICIOUS ATTACK

1. Use strong data encryption for sensitive information.
2. Implement secure authentication with multi-factor options.
3. Enforce strict authorization and access control.
4. Validate and sanitize user input to prevent common attacks.
5. Use secure network communication (HTTPS).
6. Ensure secure session management to prevent session hijacking.
7. Store sensitive data securely using encryption and hashing.
8. Regularly update the app and dependencies with security patches.
9. Conduct penetration testing to identify and fix vulnerabilities.

10. Educate users about security best practices.