

Non-Functional requirements (Mobile)

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Version History

Version	Date	What Changed	Author
1.0	15 Mar 2024	NFR for 'Instagram' product are created.	Iryna Gurskaya

Devices For Testing

iOS Devices for testing

Device	iOS	Screen Resolution
iPhone XR	iOS 13	1792 x 828
iPhone 14 Pro	iOS 16	2556 x 1179
iPhone 15 Plus	iOS 17	2796 x 1290

Supported iOS devices: This Mobile application can be installed on iOS 12-17 devices.

Android Devices for testing

Device	Android	Screen Resolution
Samsung Galaxy S9	Android 9	2960x1440
Google Pixel 5	Android 13	2340x1080
Galaxy S23 Ultra	Android 14	3088 x 1440

Supported Android Devices: This Mobile application can be installed on devices with Android OS from 6 to 14.
The Mobile application may contain device-specific issues that were not included in the list of tested devices.

Note: functional testing will be performed only on the devices stated above.

Localization

Instagram is accessible and usable for users across different regions and languages.



1. Language Support:

- Instagram should support multiple languages to serve a diverse user base.
- The application should provide language options that cover a wide range of commonly spoken languages worldwide.
- Text displayed within the application, including user interface elements, notifications, and error messages, should be localized to the selected language.

2. Regional Adaptation:

- Instagram should adapt content, recommendations, and features based on the user's geographic location.
- Location-based services, such as geotagging and location-based search, should be accurate and reliable across various regions.
- Regional differences in cultural norms, holidays, and events should be considered in content recommendations and promotions.

3. Time Zone Support:

- The application should accurately display timestamps for posts, messages, and other time-sensitive interactions based on the user's time zone.
- Time-related features, such as scheduling posts or events, should adjust dynamically based on the user's current time zone.

4. Currency and Units:

- Instagram's shopping and advertising features should support multiple currencies and units of measurement to accommodate international transactions.
- Prices, shipping costs, and other monetary values should be displayed in the user's preferred currency based on their location or settings.

5. Cultural Sensitivity:

- Content moderation algorithms should be sensitive to cultural differences and avoid promoting or recommending potentially offensive or inappropriate content based on cultural norms.
- The application should provide tools for users to report culturally insensitive or offensive content, with appropriate mechanisms for review and action by moderators.

6. Localized Content Search:

- Instagram's content discovery algorithms should consider regional interests, trends, and popular topics when recommending content to users.
- Explore and search functionalities should prioritize content that is relevant and engaging to users in their respective regions.

7. Localization Testing:

- Regular testing should be conducted to ensure that localized versions of Instagram are functionally equivalent to the primary version.
- Testing should cover language support, regional adaptation, time zone handling, currency conversion, and cultural sensitivity across various devices and platforms.

Measurement and Evaluation:

- The effectiveness of localization efforts can be measured through user feedback, user engagement metrics (such as time spent on the app and interaction rates), and retention rates across different regions and language markets.
- Regular monitoring of user sentiment and satisfaction through surveys and reviews can help identify areas for improvement in localization strategies.

Constraints:

- The availability of language resources, cultural expertise, and regional data may influence the speed and scope of localization efforts.
- Legal and regulatory requirements in certain regions may impose constraints on content availability, censorship, and data localization.

Dependencies:

- Collaboration with localization teams, translators, cultural consultants, and legal experts is essential to ensure accurate and culturally sensitive localization.
- Integration with third-party services for language translation, geolocation, and currency conversion may be necessary to support localization features effectively.

Security

Confidentiality, integrity, and availability of user data and the platform's resources, protecting against unauthorized access, data breaches, and malicious activities should be ensured.



1. Data Encryption:

- All sensitive user data, including passwords, personal information, and private messages, should be encrypted both in transit and at rest using industry-standard encryption algorithms.
- Encryption keys should be managed securely and rotated periodically to mitigate the risk of key compromise.

2. Authentication and Authorization:

- Instagram should implement robust authentication mechanisms, such as multi-factor authentication (MFA), to verify the identity of users and prevent unauthorized access to accounts.
- Access controls should be enforced at the granular level to ensure that users only have access to the resources and features appropriate for their roles and permissions.

3. Secure Communication Channels:

- Communication between the Instagram application and its servers should be encrypted using protocols such as HTTPS to prevent eavesdropping and man-in-the-middle attacks (MITM).
- Third-party integrations and API endpoints should require authentication and authorization to access user data securely.

4. User Privacy Protection:

- Instagram should provide users with granular controls over their privacy settings, allowing them to manage visibility, audience, and data-sharing preferences for their profiles and content.
- User consent should be obtained before collecting and processing personal information, and transparent disclosures should be provided regarding data usage practices.

5. Secure Software Development Practices:

- The development of Instagram's software should follow secure coding practices, including input validation, output encoding, and parameterized queries, to mitigate common vulnerabilities such as injection attacks and cross-site scripting (XSS).
- Regular security assessments, code reviews, and penetration testing should be conducted to identify and remediate security vulnerabilities in the application.

6. Incident Response and Recovery:

- Instagram should have documented incident response procedures in place to detect, respond to, and recover from security incidents such as data breaches or denial-of-service (DoS) attacks.
- Emergency response teams should be trained and equipped to handle security incidents promptly, with communication channels established to notify affected users and stakeholders.

7. Compliance and Regulatory Requirements:

- Instagram should comply with relevant data protection laws and regulations, such as the General Data Protection Regulation (GDPR), California Consumer Privacy Act (CCPA), and Children's Online Privacy Protection Act (COPPA).
- Regular audits and assessments should be conducted to ensure ongoing compliance with security standards and regulatory requirements.

Measurement and Evaluation:

- Security performance can be evaluated through regular security assessments, vulnerability scans, and penetration tests to identify and remediate security weaknesses.
- Incident response metrics, such as mean time to detect (MTTD) and mean time to respond (MTTR), can measure the effectiveness of the security incident response process.

Constraints:

- Balancing security measures with usability and performance considerations is essential to maintain a positive user experience while ensuring robust security protections.
- Compliance with regulatory requirements may impose constraints on data processing, storage, and sharing practices, requiring careful consideration during system design and implementation.

Dependencies:

- Collaboration with security experts, penetration testing firms, and legal advisors is necessary to develop and implement effective security controls and compliance measures.
- Integration with third-party security tools and services may be required to enhance threat detection, incident response, and compliance management capabilities.

Usability

Instagram provides an intuitive, efficient, and satisfying user experience across different devices and platforms, enhancing user engagement and satisfaction.



1. Intuitive User Interface:

- The Instagram application should feature a user-friendly interface with intuitive navigation, clear visual hierarchy, and consistent design patterns.
- Common actions, such as posting photos, sending messages, and exploring content, should be easily accessible and straightforward to perform.

2. Accessibility:

- Instagram should adhere to accessibility standards, such as the Web Content Accessibility Guidelines (WCAG), to ensure that the application is usable by individuals with disabilities.
- Features such as alternative text for images, keyboard navigation, and screen reader compatibility should be implemented to support users with visual or motor impairments.

3. Personalization and Customization:

- Instagram should provide users with options to personalize their experience, including customizable themes, font sizes, and color schemes.
- Content recommendations and feed algorithms should be tailored to each user's preferences and interests, allowing for a personalized browsing experience.

4. Efficient Content Discovery:

- The Explore tab and search functionality should facilitate efficient content discovery, allowing users to find relevant and interesting content based on their interests and social connections.
- Filters, tags, and categories should be provided to help users narrow down their search results and discover niche content within the platform.

5. Feedback and Error Handling:

- Instagram should provide clear and actionable feedback to users when performing actions, completing tasks, or encountering errors.
- Error messages should be informative and user-friendly, guiding users on how to resolve issues effectively.

6. Performance Optimization:

- The application should prioritize speed and responsiveness, minimizing loading times and delays in content delivery to ensure a seamless browsing experience.

- Images and multimedia content should be optimized for fast loading without compromising quality, especially on mobile devices with limited bandwidth.

7. Onboarding and User Guidance:

- Instagram should provide new users with an intuitive onboarding process, guiding them through the key features and functionalities of the application.
- Help resources, tutorials, and tooltips should be available to assist users in learning how to use Instagram effectively and discover its full potential.

Availability

Consistent access to Instagram, both online and offline, while maintaining service availability and resilience.



1. Offline Usability:

- The Instagram app should remain usable in offline mode for browsing previously downloaded content, except for login and sync processes, which require an internet connection.

2. Remote Content Updates:

- Content updates for the Instagram mobile app can be performed remotely within the admin panel, ensuring timely updates and feature enhancements without requiring app updates from Google Play or the App Store.

3. Mobile App Availability:

- The Instagram mobile app must be available for download from Google Play and the App Store, ensuring accessibility to users on both Android and iOS platforms.

Performance

Instagram's responsiveness and efficiency to provide a smooth user experience, in alignment with agreed performance metrics.



1. Visual Feedback for Loading:

- When the app is fetching information from the server or updating/loading screen content, a spinner or other visual indicator should be displayed to communicate to the user that an action is in progress.

2. Agreed Performance Metrics:

Performance requirements must be collaboratively defined and agreed upon by the client, developers, and QA team.

- First App Launch: The initial app launch should be completed within 2 seconds to provide a seamless user experience.
- Responsiveness: The app should respond to user taps within 300 milliseconds to maintain interactivity and user engagement.
- Maximum Response Time: No action within the app should take longer than 3 seconds to process.
- Average Response Time: The average response time for actions within the app should be maintained at 1 second or less.
- Battery Usage: The app should optimize battery consumption to ensure prolonged usage without significantly draining the device's battery.
- Maximum/Average Simultaneous Users: The app should support a maximum of 10 million simultaneous users with an average of 5 million concurrent users during peak hours.
- Total Number of Users: The app should accommodate up to 1 billion registered users globally.
- Average Throughput and Peak Concurrent Users: The app should maintain an average throughput of 1000 actions per second with a peak of 5000 concurrent active users per device and operating system.
- Maximum/Average Actions per Time: The app can process a maximum of 100,000 actions per minute on average, with peak loads reaching up to 200,000 actions per minute.

Reliability

Instagram's reliability by maintaining consistent performance and availability, minimizing downtime, and ensuring data integrity.



1. High Availability:

- Instagram should strive for high availability, aiming for an uptime of at least 99.9% over any given period to ensure uninterrupted access for users.

2. Fault Tolerance:

The system should be designed with fault-tolerant mechanisms to mitigate the impact of hardware failures, software bugs, or network issues, minimizing disruptions to user experience.

- Number of Critical Failures, Time: Critical failures, defined as instances where the application becomes unresponsive or crashes, should not exceed 5 incidents per 10,000 user sessions within 30 days.
- Mean Time Between Failures: The application should demonstrate a mean time between failures (MTBF) of at least 10,000 hours, indicating prolonged periods of stable operation between system failures.
- Data Safety in Negative Cases: In case of system failures or interruptions, user data should be safeguarded to prevent data loss or corruption, ensuring data integrity and recovery capabilities.

3. Monitoring and Alerting:

- Continuous monitoring of system health, performance metrics, and availability indicators should be conducted to detect anomalies and potential issues proactively.
- Automated alerting systems should notify operations teams of critical events or performance degradation, enabling swift response and resolution.

Third-Party Services

Seamless integration and reliable operation with specific third-party services to enhance Instagram's functionality and user experience.



1. Social Media Platforms:

- Integration with social media platforms such as Facebook, Twitter, and LinkedIn for sharing Instagram content, cross-platform engagement, and user authentication.

2. Analytics and Reporting Tools:

- Compatibility with analytics and reporting services like Google Analytics, Adobe Analytics, or Mixpanel for tracking user engagement, audience demographics, and campaign performance on Instagram.

3. Advertising Networks:

- Integration with advertising networks such as Google AdWords, Facebook Ads, or Twitter Ads for managing and optimizing advertising campaigns on Instagram.

4. Content Management Systems (CMS):

- Compatibility with content management systems like WordPress, Drupal, or Joomla for embedding Instagram feeds, sharing content, and managing user-generated content on external websites.

5. E-commerce Platforms:

- Integration with e-commerce platforms such as Shopify, WooCommerce, or Magento for selling products directly through Instagram, enabling shoppable posts and product tagging features.

6. Customer Relationship Management (CRM) Systems:

- Compatibility with CRM systems like Salesforce, HubSpot, or Zoho CRM for syncing user data, tracking customer interactions, and managing customer relationships related to Instagram interactions.

7. Payment Gateways:

- Integration with payment gateways such as PayPal, Stripe, or Square for processing payments within Instagram's shopping and checkout features, ensuring secure and seamless transactions for users.

Constraints:

- Dependency on specific third-party services introduces risks related to service outages, data breaches, and changes in service offerings, requiring contingency plans and mitigation strategies to minimize impact on Instagram's operations.
- Integration with third-party services may introduce complexity and overhead in development, testing, and maintenance processes, necessitating careful management of dependencies and version compatibility.

Dependencies:

- Collaboration with third-party service providers, legal advisors, and compliance teams is necessary to negotiate contracts, establish integration protocols, and ensure adherence to security and regulatory requirements.
- Integration with monitoring tools and logging frameworks is essential to track and analyze interactions with third-party services and detect anomalies or performance issues proactively.

By adhering to these non-functional requirements, Instagram can maintain its position as a leading social media platform, fostering user engagement, trust, and satisfaction. Continuous monitoring, evaluation, and optimization of these NFRs will be essential to meet evolving user expectations and industry standards, driving Instagram's ongoing growth and success.