**Non-functionality part 3:**

The non-functional requirements listed below define the web application's key attributes in addition to its basic functionality. These help to ensure that the system is dependable, user-friendly, secure, and available to all authorized users.

**USABILITY**

The user interface demands simplicity through big buttons and clear font alongside descriptive labels. The text needs high color contrast to enable easy reading. Interactive components and buttons need strategic placement to minimize errors and provide immediate feedback to users. The layout needs to function across various devices through support for multiple screen dimensions. The search function together with filter options should enable fast patient information retrieval. A uniform design structure prevents users from needing to learn system elements repeatedly. New users will find assistance through in-app tutorials and tooltips as well as a help center. Regular usability testing must include real users to identify problems which will enhance the system’s performance and user experience.

**ACCESSIBILITY**

The system needs to support users with visual, physical, cognitive or auditory impairments and must comply with WCAG 2.1. The system should provide keyboard navigation functionality together with alt text and high contrast visuals and text-to-speech capabilities. The layout together with buttons should use straightforward language that is easy to understand. Users should have the ability to customize accessibility features including font size and contrast options. The application needs to provide multilingual support through translation tools which should not decrease performance levels. Help guides and tooltips must be localized. The application needs to operate on older devices and slower networks while maintaining its core features. Users with disabilities need to participate in testing to detect usability problems which will enhance actual system performance in areas with limited resources.

**AVAILABILITY**

The system should operate at 99.5% uptime with minimal downtime. The system should enable users to enter data and upload X-rays when offline before syncing the information when the device reconnects to the network. Hosting should be secure with backups. Load balancing is necessary to distribute traffic without performance degradation. The system needs failover mechanisms to maintain operation when failures occur. Maintenance tasks need to be planned to minimize system interruptions. Real-time monitoring is necessary to detect issues early. Regional data centers will enhance speed for users situated in different geographical areas. The implemented measures enhance system availability across different operational conditions particularly in field clinics with limited resources and during internet service disruptions.

**Performance**

The system must process chest X-ray images and deliver a preliminary pneumonia diagnosis within five seconds. It must support at least 50 concurrent users without performance degradation, ensuring health workers and remote clinicians experience consistent speeds. Caching techniques, image compression handling, and optimized database queries must be implemented to minimize loading times. Even with large image files, the system should remain responsive, preventing bottlenecks that could slow down critical patient assessments.

**Security**

The app must ensure the confidentiality, integrity, and availability of sensitive patient data. All data transmissions must use HTTPS encryption, and data stored on the server must be encrypted at rest. Role-based access control (RBAC) must limit health workers to accessing only their clinic's patient records, while clinicians have broader access for diagnosis reviews. Multi-factor authentication (MFA) must be implemented for remote clinician logins to prevent unauthorized access. Routine security audits and vulnerability assessments must be conducted to mitigate emerging threats and ensure the system remains secure.