Sillah (صلة) – Non-Functional Requirements
Phase II Requirements Documentation

Table of Contents

1.0 Introduction & Overview

This document specifies the **Non-Functional Requirements (NFRs)** for the Sillah Family Health Management System across **Usability, Reliability, and Security**. The goal is to ensure the platform is simple to use, robust, and safe for all users in Saudi Arabia. Items marked **[Conceptual]** indicate production-level expectations. In **Phase IV** (Java prototype), those items will be **simulated or documented**, while core functionality will be **implemented**.

2.0 Usability Requirements

UR-01: Mobile-First Responsive Design

Priority: Critical
Phase IV: Implement
Rationale: Most users in Saudi Arabia access services via mobile; optimizing for phones maximizes reach.
User Stories: SIL-7 to SIL-16

Requirement:
Interface must work across screen sizes, prioritizing mobile.

Acceptance Criteria:

- Passes Google Mobile-Friendly Test
- Verified on iPhone (Safari) and Android (Chrome)
- **Viewport meta tag is set correctly**
- Touch targets ≥ 44×44 px (WCAG)
- No horizontal scrolling

UR-02: WCAG 2.1 Level AA Accessibility

Priority: High
Phase IV: Implement core; document full compliance
Rationale: Public services must be accessible and legally compliant.
User Stories: SIL-7 to SIL-16

Requirement:
Meet WCAG 2.1 AA guidelines.

Acceptance Criteria:

- WAVE/axe automated scan: zero critical errors
- Manual test with NVDA or JAWS
- Keyboard-only navigation succeeds
- Color contrast verified with WebAIM (≥ 4.5:1 normal text)

UR-03: Task Completion Efficiency

Priority: High
Phase IV: Implement
Rationale: Faster tasks increase adoption and adherence to preventive actions.
User Stories: SIL-7, SIL-13, SIL-14

Requirement:
Key tasks should be quick and low-effort.

Acceptance Criteria:

- Build a basic family tree in < 5 minutes (≥ 15 participants)
- Find & download a checklist in < 3 minutes
- ≥ 90% success on critical tasks without help

UR-04: Bilingual Interface (Arabic & English)

Priority: High
Phase IV: Implement
Rationale: Serves both Arabic speakers and expatriates.
User Stories: SIL-7 to SIL-16

Requirement:
Full bilingual support.

Acceptance Criteria:

- 100% UI translated
- RTL layout correct for Arabic
- Language preference persists
- Medical terminology reviewed by an Arabic-speaking clinician

UR-05: Clear Error Messages & Guidance

Priority: High
Phase IV: Implement
Rationale: Friendly, actionable errors reduce frustration and support load.
User Stories: SIL-7, SIL-8, SIL-15

Requirement:
Errors must be specific, polite, and near the relevant field.

Acceptance Criteria:

- Messages free of technical jargon
- Inline placement beside fields
- Visible success states with confirmation

UR-06: Intuitive Information Architecture

Priority: High
Phase IV: Implement
Rationale: Logical structure lowers cognitive load.
User Stories: SIL-7 to SIL-16

Requirement:
Content and features must be easy to find.

Acceptance Criteria:

- ≤ 3 clicks to any feature
- “Ease of finding” rating ≥ 4/5
- Breadcrumbs available site-wide

UR-07: Consistent Design System

Priority: Medium
Phase IV: Implement
Rationale: Consistency speeds learning and builds trust.
User Stories: SIL-7 to SIL-16

Requirement:
Use a shared design system and components.

Acceptance Criteria:

- Style guide documented
- Component library in use
- Visual QA confirms consistency

UR-08: Onboarding & First-Time UX

Priority: Medium
Phase IV: Implement
Rationale: A strong first session boosts retention.
User Stories: SIL-15

Requirement:
New users understand the product and complete setup easily.

Acceptance Criteria:

- ≥ 80% onboarding completion
- Average time < 3 minutes
- Consent captured with timestamp

UR-09: Plain-Language Readability

Priority: High
Phase IV: Implement
Rationale: Health literacy varies; content must be clear.
User Stories: SIL-11, SIL-12

Requirement:
Public-friendly language with minimal jargon.

Acceptance Criteria:

- Reviewed by non-medical staff
- Flesch-Kincaid ≈ 8th grade
- User tests confirm understanding

UR-10: Visual Feedback & System Status

Priority: Medium
Phase IV: Implement
Rationale: Clear feedback reduces anxiety and confusion.
User Stories: SIL-7 to SIL-16

Requirement:
Always show what's happening and what comes next.

Feedback Examples:

- Spinner for quick actions (< 2s)
- Progress bar for longer actions (> 2s)
- Success/error toasts (top-right, auto-dismiss)
- Skeleton screens during content loads

Acceptance Criteria:

- All loading states implemented
- Success/error feedback within 1 second
- No "frozen" actions

UR-11: Help & Support Access

Priority: Medium
Phase IV: Document
Rationale: Accessible help reduces drop-off and tickets.
User Stories: SIL-7 to SIL-16

Requirement:
Help is easy to find and use.

Acceptance Criteria:

- Help in Arabic & English
- FAQ covers ≥ 80% common questions
- Email support live; WhatsApp noted as future option
- Responses within 48 hours

UR-12: System Usability Scale (SUS)

Priority: High
Phase IV: Document
Rationale: SUS is a validated, standard usability metric.
User Stories: SIL-7 to SIL-16

Requirement:
Run SUS and meet score targets.

Acceptance Criteria:

- ≥ 15 participants
- Standard 10 SUS items used
- Target ≥ 80 (A); minimum ≥ 70 (C)

3.0 Reliability Requirements

RR-01: Availability & Uptime [Conceptual]

Priority: Critical
Phase IV: Document
Rationale: Users need access when risk alerts matter most.
User Stories: SIL-7 to SIL-16

Requirement:
High availability with minimal unplanned downtime.

Acceptance Criteria:

- Monthly uptime target **99.5%** (≤ 3.65 hours downtime)
- Automated monitoring & alerts
- Public status page

RR-02: Backup & Disaster Recovery [Conceptual]

Priority: Critical
Phase IV: Document
Rationale: Family health data must not be lost.
User Stories: SIL-7 to SIL-10

Requirement:
Robust backups and tested recovery.

Acceptance Criteria:

- Automated backups verified
- **RPO ≤ 6 hours**; **RTO ≤ 4 hours**
- Quarterly DR drills

RR-03: Graceful Degradation & Fault Tolerance

Priority: High
Phase IV: Implement
Rationale: Partial service is better than outage.
User Stories: SIL-7 to SIL-16

Requirement:
Keep core features usable during failures.

Acceptance Criteria:

- **Map fallback to list view** when the map API is down
- No raw stack traces shown to users
- Fallbacks enabled for core features
- Friendly error messages

RR-04: Data Accuracy & Integrity

Priority: Critical
Phase IV: Implement
Rationale: Incorrect risk results undermine the system's purpose.
User Stories: SIL-7 to SIL-10

Requirement:
Protect data quality and detect risks accurately.

Acceptance Criteria:

- **False negatives ≤ 1%** on a defined test set
- **False positives < 5%** from entry errors
- DB constraints prevent impossible data
- **100%** detection on known-risk test trees

RR-05: Browser & Device Compatibility

Priority: High
Phase IV: Implement
Rationale: Equal access across common environments.
User Stories: SIL-7 to SIL-16

Requirement:
Consistent behavior on supported browsers/devices.

Acceptance Criteria:

- Identical behavior on latest two versions
- Visual consistency verified
- Unsupported browsers get an upgrade notice

RR-06: Performance Under Load [Conceptual]

Priority: High
Phase IV: Document
Rationale: Campaigns can create traffic spikes.
User Stories: SIL-7 to SIL-16

Requirement:
Remain reliable under heavy load.

Acceptance Criteria:

- Capacity for **10,000** concurrent users validated
- Error rate < 1% at peak
- Auto-scaling configured and tested

RR-07: Content Consistency & Currency

Priority: High
Phase IV: Document
Rationale: Medical information must be accurate and current.
User Stories: SIL-11, SIL-12

Requirement:
Editorial process ensures quality.

Acceptance Criteria:

- Medical approval before publishing
- Annual content review
- Visible review dates

RR-08: Session Reliability & State

Priority: Medium
Phase IV: Implement
Rationale: Users shouldn't lose in-progress work.
User Stories: SIL-7, SIL-8

Requirement:
Stable sessions and preserved drafts.

Acceptance Criteria:

- Auto-save every **30 seconds** (timeout aligned with SR-03)
- Warning 2 minutes before expiry with extend option
- Form data survives refresh
- No data loss during timeout tests

RR-09: API Reliability & Error Handling

Priority: High
Phase IV: Implement
Rationale: Networks fail; the app should not.
User Stories: SIL-7 to SIL-16

Requirement:
Handle errors gracefully and retry wisely.

Acceptance Criteria:

- **≥ 95% successful responses** under normal load
- Exponential backoff retries (3 attempts)
- Circuit breaker avoids cascades
- Clear user-facing errors

RR-10: Notification Delivery Reliability

Priority: Medium
Phase IV: Simulate
Rationale: Missing a risk alert defeats the purpose.
User Stories: SIL-9, SIL-10

Requirement:
Deliver critical alerts reliably and track outcomes.

Acceptance Criteria:

- Queued notifications
- Delivery tracking in DB
- **99%** delivery target for critical alerts
- Failed deliveries visible to admins

4.0 Security Requirements

SR-01: Encryption at Rest [Conceptual]

Priority: Critical
Phase IV: Document
Rationale: Protect PHI in line with **Saudi PDPL**.
User Stories: SIL-7 to SIL-16

Requirement:
Encrypt stored sensitive health data.

Acceptance Criteria:

- AES-256 for PHI fields
- Keys stored separately
- Prototype documents the policy; production uses a KMS

SR-02: Encryption in Transit [Conceptual]

Priority: Critical
Phase IV: Document
Rationale: Prevent eavesdropping/MITM.
User Stories: SIL-7 to SIL-16

Requirement:
Enforce HTTPS with modern TLS.

Acceptance Criteria:

- HTTP → HTTPS redirect
- TLS 1.3 enforced
- Valid CA-issued certificate
- HSTS documented for production

SR-03: Authentication

Priority: Critical
Phase IV: Implement
Rationale: Only authorized users should access health data.
User Stories: SIL-15

Requirement:
Follow secure authentication practices.

Acceptance Criteria:

- Weak passwords rejected
- Session tokens rotated at login
- Auto-logout after 15 minutes (mirrors RR-08)
- Prototype documents hashing policy; production uses **bcrypt ≥ 12 rounds** + breached-password checks

SR-04: Role-Based Access Control (RBAC)

Priority: Critical
Phase IV: Implement
Rationale: Enforce least privilege by role.
User Stories: SIL-7 to SIL-16

Requirement:
Three roles with appropriate permissions.

Acceptance Criteria:

- Role set at account creation
- Unauthorized access attempts blocked and logged

- UI hides unavailable options
- **Server-side role checks on every protected API**

SR-05: Consent Management

Priority: High
Phase IV: Implement
Rationale: Ethical/legal basis for processing health data.
User Stories: SIL-7, SIL-15

Requirement:
Collect explicit consent before data entry.

Acceptance Criteria:

- Consent screen cannot be bypassed
- Timestamped consent recorded
- Users can withdraw and request deletion
- Disclaimer: “alerts are screening recommendations, not diagnoses”

SR-06: Audit Logging

Priority: Medium
Phase IV: Document
Rationale: Monitoring, forensics, and accountability.
User Stories: SIL-7 to SIL-16

Requirement:
Log important security events.

Acceptance Criteria:

- Automatic logging of defined events
- Tamper-resistant storage
- Retention ≥ 90 days

SR-07: Input Validation & Sanitization

Priority: High
Phase IV: Implement

Rationale: Prevent injection and XSS.
User Stories: SIL-7, SIL-8, SIL-11, SIL-12

Requirement:
Validate and sanitize all inputs.

Acceptance Criteria:

- Server-side validation
- Parameterized DB queries
- Output encoding for user content

SR-08: Privacy by Design – Data Minimization

Priority: High
Phase IV: Implement
Rationale: Reduce risk and comply with PDPL.
User Stories: SIL-7 to SIL-16

Requirement:
Collect only what's necessary; minimize retention.

Acceptance Criteria:

- Documented justification for each data point
- No unnecessary optional fields
- Anonymous analytics (no individual tracking)

SR-09: Secure Password Reset

Priority: Medium
Phase IV: Implement
Rationale: Password reset must not be an attack vector.
User Stories: SIL-15

Requirement:
Harden the reset flow.

Acceptance Criteria:

- Token valid for 1 hour
- Email delivery only

- Account lockout after 5 failed attempts

SR-10: Awareness Hub Content Security

Priority: Medium
Phase IV: Document
Rationale: Keep downloads safe and content trustworthy.
User Stories: SIL-11, SIL-12

Requirement:
Secure uploads and content management.

Acceptance Criteria:

- AV scan on uploads
- File-type whitelist
- Admin 2FA for content management
- Approval workflow before publishing

5.0 Security Testing Requirements

Validate security by:

1. **Penetration Testing:** Independent assessment before production.
2. **Automated Scanning:** OWASP ZAP (or similar) in CI/CD.
3. **Code Review:** Focus on auth and data access paths.
4. **Compliance Check:** Verify against **Saudi PDPL**.

6.0 Traceability Matrix

ID	Priority	Phase IV	Stories	Key Metric	Test Method
UR-01	CRITICAL	Implement	SIL-7…SIL-16	Mobile-optimized	Google Mobile Test
UR-02	HIGH	Implement	SIL-7…SIL-16	WCAG 2.1 AA	WAVE/axe
UR-03	HIGH	Implement	SIL-7,13,14	Task time	Usability test
UR-04	HIGH	Implement	SIL-7…SIL-16	100% bilingual	Language review
UR-05	HIGH	Implement	SIL-7,8,15	Clear errors	User testing
UR-06	HIGH	Implement	SIL-7…SIL-16	≤ 3 clicks	Tree test
UR-07	MEDIUM	Implement	SIL-7…SIL-16	Consistency	Visual QA
UR-08	MEDIUM	Implement	SIL-15	≥ 80% complete	Completion rate
UR-09	HIGH	Implement	SIL-11,12	8th grade	Readability test

UR-10	MEDIUM	Implement	SIL-7…SIL-16	Feedback ≤ 1s	Perf test
UR-11	MEDIUM	Document	SIL-7…SIL-16	Bilingual help	Doc review
UR-12	HIGH	Document	SIL-7…SIL-16	SUS ≥ 80	SUS survey
RR-01	CRITICAL	Document	SIL-7…SIL-16	99.5% uptime	Pingdom
RR-02	CRITICAL	Document	SIL-7-10	RPO 6h, RTO 4h	DR drill
RR-03	HIGH	Implement	SIL-7…SIL-16	Degradation	Chaos testing
RR-04	CRITICAL	Implement	SIL-7-10	≤ 1% FN	Unit tests
RR-05	HIGH	Implement	SIL-7…SIL-16	Cross-browser	BrowserStack
RR-06	HIGH	Document	SIL-7…SIL-16	10k concurrent	JMeter
RR-07	HIGH	Document	SIL-11,12	Annual review	Med review
RR-08	MEDIUM	Implement	SIL-7,8	Auto-save 30s	Session tests
RR-09	HIGH	Implement	SIL-7…SIL-16	≥ 95% success	API monitoring
RR-10	MEDIUM	Simulate	SIL-9,10	99% delivery	Notification test
SR-01	CRITICAL	Document	SIL-7…SIL-16	AES-256	Documentation
SR-02	CRITICAL	Document	SIL-7…SIL-16	TLS 1.3+	SSL test
SR-03	CRITICAL	Implement	SIL-15	Secure auth	Code review
SR-04	CRITICAL	Implement	SIL-7…SIL-16	RBAC	Access tests
SR-05	HIGH	Implement	SIL-7,15	Consent mgmt	Compliance check
SR-06	MEDIUM	Document	SIL-7…SIL-16	90-day logs	Audit review
SR-07	HIGH	Implement	SIL-7,8,11,12	Validation	Security scan
SR-08	HIGH	Implement	SIL-7…SIL-16	Minimization	Privacy review
SR-09	MEDIUM	Implement	SIL-15	Reset security	Security test
SR-10	MEDIUM	Document	SIL-11,12	Admin 2FA	Documentation

7.0 Implementation Summary

Total NFRs: 32

- **Critical:** 9
- **High:** 15
- **Medium:** 8

Phase IV plan:

- **Implement:** 18 (prototype core)
- **Simulate:** 1 (notification delivery)
- **Document:** 13 (production-scale, conceptual)

Prototype focus:

- Responsive family health tree
- Basic risk rules with validation
- Arabic/English content
- Secure authentication
- Reliable session + auto-save
- Clear feedback and messaging

Architectural drivers for Phase III:

- **RR-08** Session reliability → session store strategy
- **UR-02** Accessibility → UI framework & components
- **SR-03** Authentication → security module design
- **UR-01** Mobile-first → responsive patterns
- **RR-03** Degradation → fault-tolerance approach
- **UR-04** Bilingual → i18n/RTL framework

Next Steps: Use these NFRs as constraints and validation criteria in Phase III design and Phase IV demo..