

Functional Requirements

Functional Requirements Specification (FRS): {{PROJECT_NAME}}

“ **Project:** {{PROJECT_NAME}} **Version:** {{VERSION}} **Date:** {{DATE}}
Author: {{AUTHOR}} **Status:** Draft | In Review | Approved **Reviewers:**
{{REVIEWERS}}

Document History

Version	Date	Author	Changes
0.1	{{DATE}}	{{AUTHOR}}	Initial draft

1. System Overview

System Name: {{SYSTEM_NAME}} **System Purpose:** {{PURPOSE_2_3_SENTENCES}}

System Context Diagram:

```
graph TB
    subgraph "{{SYSTEM_NAME}}"
        UI[Web / Mobile UI]
        API[Backend API]
        DB[(Database)]
    end
    U1[{{USER_TYPE_1}}] -->|Uses| UI
```

U2[{{USER_TYPE_2}}] -->|Uses| UI
API -->|Reads/Writes| DB
API -->|Integrates| EXT1[{{EXTERNAL_SERVICE_1}}]
API -->|Integrates| EXT2[{{EXTERNAL_SERVICE_2}}]
ADM[Admin] -->|Manages| UI

2. Actors & Personas

Actor ID	Actor Name	Type	Description	Access Level
ACT-01	{{ACTOR_NAME}}	Human / System	{{DESCRIPTION}}	{{ROLE/PERMISSIONS}}
ACT-02	End User	Human	{{PERSONA_DESCRIPTION}}	Authenticated user
ACT-03	Administrator	Human	Manages system configuration and users	Admin
ACT-04	{{EXTERNAL_SYSTEM}}	System	External service integrated via API	System

Persona Detail

Persona: {{PERSONA_NAME}}

- **Role:** {{JOB_TITLE}}
- **Goal:** {{PRIMARY_GOAL_USING_SYSTEM}}
- **Pain Points:** {{CURRENT_FRUSTRATIONS}}
- **Tech Savviness:** Low / Medium / High
- **Frequency of Use:** Daily / Weekly / Monthly

3. Functional Requirements

3.1 Module: {{MODULE_1_NAME}}

Module Overview

{{MODULE_DESCRIPTION}}

FR-001: {{FEATURE_NAME}}

Attribute	Value
Module	{{MODULE_1_NAME}}
Priority	Must Have
Trace	BR-{{XXX}}
UI Reference	[Figma link or mockup filename]

Description: {{FEATURE_DESCRIPTION_IN_BUSINESS_LANGUAGE}}

Acceptance Criteria:

- ☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}
- ☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}
- ☐ **Given** invalid input, **when** {{USER_ACTION}}, **then** {{ERROR_HANDLING}}

Data Requirements:

- Input: {{INPUT_DATA_FIELDS_AND_TYPES}}
- Output: {{OUTPUT_DATA}}
- Validation: {{VALIDATION_RULES}}

Business Rules:

- RUL-{{XX}}: {{APPLICABLE_BUSINESS_RULE}}

Dependencies: FR-{{XXX}}, DEP-{{XX}}

FR-002: {{FEATURE_NAME}}

Attribute	Value
Module	{{MODULE_1_NAME}}
Priority	Must Have
Trace	BR-{{XXX}}
UI Reference	

Description: {{FEATURE_DESCRIPTION}}

Acceptance Criteria:

- ☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}

☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}

Data Requirements:

- Input: {{INPUT}}
- Output: {{OUTPUT}}
- Validation: {{VALIDATION}}

Business Rules: {{APPLICABLE_RULES}}

Dependencies: {{DEPENDENCIES}}

3.2 Module: {{MODULE_2_NAME}}

Module Overview

{{MODULE_DESCRIPTION}}

FR-010: {{FEATURE_NAME}}

Attribute	Value
Module	{{MODULE_2_NAME}}
Priority	Must Have
Trace	BR-{{XXX}}
UI Reference	

Description: {{FEATURE_DESCRIPTION}}

Acceptance Criteria:

- ☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}
- ☐ **Given** {{PRECONDITION}}, **when** {{USER_ACTION}}, **then** {{EXPECTED_RESULT}}

Data Requirements:

- Input: {{INPUT}}
- Output: {{OUTPUT}}
- Validation: {{VALIDATION}}

Business Rules: {{APPLICABLE_RULES}}

Dependencies: {{DEPENDENCIES}}

3.3 Module: Authentication & Authorization

FR-020: User Registration

Attribute	Value
Priority	Must Have
Trace	BR-{{XXX}}

Description: Users can create a new account using email and password.

Acceptance Criteria:

- ☐ **Given** a valid email and password (≥ 8 chars, 1 uppercase, 1 number), **when** user submits registration form, **then** account is created and confirmation email is sent
- ☐ **Given** an already-registered email, **when** user tries to register, **then** system shows "Email already in use" error
- ☐ **Given** password does not meet complexity rules, **when** user submits, **then** inline validation error shown before submit

Data Requirements:

- Input: email (unique), password, {{ADDITIONAL_FIELDS}}
- Output: user record, confirmation token
- Validation: email format, password complexity, duplicate check

FR-021: User Login

Attribute	Value
Priority	Must Have
Trace	BR-{{XXX}}

Description: Authenticated users can log in with email and password.

Acceptance Criteria:

- ☐ **Given** valid credentials, **when** user submits login form, **then** user is authenticated and redirected to dashboard
- ☐ **Given** invalid credentials, **when** user submits, **then** generic error "Invalid email or password" is shown (no enumeration)

- ☐ **Given** 5 consecutive failed attempts, **when** user tries again, **then** account is temporarily locked for 15 minutes
- ☐ **Given** an authenticated session, **when** user is idle for 30 minutes, **then** session expires and user is redirected to login

3.4 Module: {{MODULE_N_NAME}}

FR-030: {{FEATURE_NAME}}

4. Use Case Diagrams

4.1 {{MODULE_1_NAME}} Use Cases

```
graph LR
    A1(({{ACTOR_1}})) --> UC1[FR-001: {{FEATURE}}]
    A1 --> UC2[FR-002: {{FEATURE}}]
    A2(({{ACTOR_2}})) --> UC3[FR-010: {{FEATURE}}]
    A2 --> UC4[FR-011: {{FEATURE}}]
    A3((Admin)) --> UC5[FR-020: {{FEATURE}}]
    A3 --> UC6[FR-021: {{FEATURE}}]
```

4.2 System-Level Use Case Overview

```
graph LR
    subgraph "{{SYSTEM_NAME}}"
        UC1[{{MODULE_1}} Functions]
        UC2[{{MODULE_2}} Functions]
        UC3[Auth Functions]
    end
    ACT1(({{ACTOR_1}})) --> UC1
    ACT1 --> UC3
    ACT2(({{ACTOR_2}})) --> UC2
    ACT2 --> UC3
    ACT3((Admin)) --> UC1
    ACT3 --> UC2
    ACT3 --> UC3
```

5. System Behavior Specifications

5.1 Error Handling

- All user-facing errors must display a human-readable message (no stack traces)
- All errors must be logged with correlation ID, timestamp, user ID (if authenticated), and action
- Validation errors shown inline, adjacent to the invalid field
- System errors show generic message + contact info; full detail logged server-side only

5.2 Data Persistence

- All user-submitted data must be persisted within `{{X}}` seconds
- Optimistic UI updates must be rolled back if server confirmation fails
- All mutations (create/update/delete) must be audited with user ID and timestamp

5.3 Session & State

- Session timeout: `{{X}}` minutes of inactivity
- Concurrent session behavior: `{{ALLOW/BLOCK/NOTIFY}}`
- Browser refresh: application state must be restored from server

5.4 Notifications

- Email notifications: `{{WHICH_EVENTS_TRIGGER_EMAILS}}`
- In-app notifications: `{{WHICH_EVENTS_TRIGGER_IN_APP}}`
- Push notifications: `{{IF_APPLICABLE}}`
- Unsubscribe mechanism required for all marketing emails (GDPR)

5.5 Accessibility

- WCAG 2.1 Level AA compliance required
- Keyboard navigation for all interactive elements
- Screen reader compatibility (ARIA labels)
- Color contrast ratio $\geq 4.5:1$

6. Requirements Summary Table

ID	Feature Name	Module	Priority	Status	Trace
FR-001	{{FEATURE}}	{{MODULE}}	Must Have	Draft	BR-001
FR-002					
FR-010					
FR-020	User Registration	Auth	Must Have	Draft	BR-xxx
FR-021	User Login	Auth	Must Have	Draft	BR-xxx

Requirements Count:

- Must Have: {{COUNT}}
- Should Have: {{COUNT}}
- Could Have: {{COUNT}}
- Won't Have (this release): {{COUNT}}

7. Traceability to Business Requirements

FR ID	Feature Name	Business Requirement (BR ID)	Business Objective (BO ID)
FR-001	{{FEATURE}}	BR-{{XXX}}	BO-{{XX}}
FR-002			

“ Full traceability matrix: requirements-traceability-matrix.md

Approval

Role	Name	Date	Signature
Author			
Reviewer			
Business Analyst			
Tech Lead			
Product Owner			

Role	Name	Date	Signature
AI Director (John)			
Client Representative			

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